01/01/1111

NORTHWEST OIL DRAIN
SUMMARY OF UNION PACIFIC RAILROAD DOCUMENTS

1. **Letter to Commissioner of Streets and Public Improvements from Acting City Engineer - January 20, 1926.**

"The agreement with the Utah Oil & Refining Company for use of the Channels in carrying waste water away stipulates the following payments: $5,000.00 on demand at the beginning of the work; $5,000.00 three months after the first payment; $5,000 three months after the second payment and $5,000.00 three months after the third payment, or a total of $20,000.00. The City has no agreement with either the OSL or D&RGW railroads relative to this drainage."

2. **Letter from S. Tanner to H. C. Jessen - August 2, 1926.**

#11 "[T]he drainage channel carries the oil, and refuse from the Utah Oil and O.S.L. [Oregon Short Line] North Yards to the lake where formerly the oil was turned into a slough near the center of Sec. 10, and during high water this oil was spread over the land making a menace to this section of the country."

. . . .

"The information regarding the oil being turned into a slough was taken from Snyder's report."

3. **Preliminary report on drainage pipelines for northwest part of city - November 14, 1949.**

"The area beginning at 4th West and 5th North Streets and extending northerly into Davis County and westerly to the Jordan River, is crossed by a number of open drains which carry storm water, warm sulfur water, wastes from Union Pacific Railroad shops, waste water from ice loading plant at 4th North and 4th West, wastes from Utah Oil Refining Company . . . .

The area of 9th North and west of 8th West is being considered for extensive development, which means that troublesome waste now being carried in open drains must either be excluded from the drains or carried in pipelines to a point beyond the expected development.

. . . .

The Sulphur water and oily wastes must be carried in a pipe which will not be disintegrated by their chemical action.

. . . .

[p.3] Pipeline No. 2. This pipeline will carry wastes from the U. P. Railroad Shops, waste from the Utah Oil Refining Company, [and] sulphur water wherever intercepted. . . ."

4. **Letter from City Engineer to Honorable John B. Matheson, Commissioner of Streets and Public Improvements - November 28, 1949.**

"In connection with our "Preliminary Report on Drainage Pipe Lines For Northwest Part of City" submitted to you under date of November 14, 1949, the following additional information is submitted.
(1) Flow from Utah Oil Refining Company, furnished by Mr. Clark on November 26, 1949. Flow from the refinery 800 to1100 gallons per minute (1.8 to 2.5 cfs.) Upstream from refinery discharge point, 800 gallons per minute, more or less (1.8 cfs). Refinery requirement four to six 6 cubic feet per second.
(2) Flow from Union Pacific Railroad shops, furnished by Mr. Godfrey on November 26, 1949. Combined flow 1.4 cubic feet per second. Maximum capacity required 3 cfs.
. . . .
Based on the meeting held in your office November 14th, a pipe line to carry wastes of sulphur water, some storm water, railroad and refinery oily wastes and ice plant water would start on 7th West near 9th North and run westerly and northerly to a point 4,000 feet north of 9th North. The data are as follows:
. . . .
Discharges as follows:
U.P.R.R. - 3.0 cfs.
Utah Oil Co. - 6.0 cfs."

Proportionate costs would be as follows:

Ice plant	6.7%	$14,070.00
City	33.3%	59,930.00
U.P.R.R.	20.0	42,000.00
Utah Oil	40.0	84,000.00

5. **Preliminary Report, Pipeline for Stormwater, Industrial Wastewater North of 9th North Street - July 1950.**

The capacities [for proposed pipe line] provided are as follows:

Utah Oil Refinery - 6 cfs
UPRR - 3 cfs

6. **Letter to Mr. J. B. Davis, Chief Engineer - Utah Ice and Storage Company - October 2, 1950.**

"Regarding discharge of wastewater from your Union Pacific Plant into open drain ditch in a ditch running North along Fourth West Street and eventually finding its way to our main outlet drainage system through the Northwest section of our City in a ditch jointly used by the Union Pacific Railroad Company, Utah Oil Refining Company, and the City storm drainage.

Since the development of homes up to Ninth North Street and with future proposed development north of this area, a new drain line will have to be built to take care of the waste drainage, particularly north of Ninth North Street. The present open drain in this area is at present a duisance [sic] and emits very pungent odors."

7. **Document - October 13, 1950.**

"At the meeting held October 10, 1950, it was agreed that a new proposal will be prepared based on eliminating Utah Ice and Storage Company water. . .
Revised capacities provided will be:

		%48"	%54"
Utah Oil Refining Co.	6 cfs	13.95	11.54
Union Pacific Railroad	3 "	6.98	5.66
City	34 and 43 "	79.07	62.69

8. **Letter to Mr. Roy McLeese, City Engineer, from Assistant City Engineer - May 23, 1951.**

"Regarding changing of and piping waste water ditch in the vicinity of Ninth North and West of Seventh West, which has been causing so much trouble with oil and fumes from discharge waste, particularly from the Utah Oil Refining Company and the Union Pacific Railroad Company.

In making a study of this situation it is now suggested that the ditch be enclosed in a 42" diameter reinforced culvert pipe . . . . All pipe to be coated with an acid resistant coating inside and outside .

. . . .

The building of this line entails a great deal of expense and as tentatively agreed in past meetings the costs shall be borne by the organizations causing the nuisance. A tentative estimate has been prepared and is attached hereto. [not attached]"

9. **Letter to Honorable Joe L. Christian, Commissioner, from City Engineer - May 25, 1951.**

Discussing same pipe line as above, apportions costs as follows: Utah Oil Refining Company - $43,711.77, Union Pacific Railroad Co. - $21,855.88, Salt Lake City - $24,219.85.

10. **Letter from Commissioner of Streets and Public Improvements to Mr. F. C. Paulson, District Manager, Union Pacific - July 31, 1951 .**

"[I]n connection with location of and piping waste water drainage now flowing in open ditch in vicinity of Ninth North Street, west from Seventh West Street and northerly.

This problem has reached a point where something must be done and the solution must be worked out soon to grant relief to a very obnoxious and bad condition . . . ."

11. **Letter to Mr. F. C. Paulson, Union Pacific, from City Engineer - August 14, 1951.**

"Because of the obnoxious odors, the fine spray of oil on adjacent houses on 9th North Street in the vicinity of this ditch, numerous complaints were received by the City and

something must be done to correct this condition. We have discussed this matter and feel that those causing the nuisance should pay proportional costs and further that the work shall be done as soon as possible.

The nature of the waste drainage from the Utah Oil Refining Company will necessitate the painting of the pipe to limit the attack on the concrete pipe . . . .

Estimated cost of project		$89,787.50
Less cost of painting interior of pipe		$4,060.00
		$85,727.50
Divided as follows:		
Utah Oil Refining Company	1/2 + cost of painting	$45,923
Union Pacific Railroad	1/4	$21,431
Salt Lake City Corporation	1/4	$21,431
		$85,727.50

12. **Letter from Mr. Paulson of Union Pacific to City Engineer - September 24, 1951.**

"We doubt that the City has requested other property owners or industries to contribute such a large proportion of the cost in similar projects under circumstances where no corrosive liquids are discharged into a sewer system by such property owners or industries, as the case with Union Pacific now."

13. **Letter to Union Pacific Railroad from City Engineer - March 11, 1952.**

Discussing meeting regarding "serious problem confronting Salt Lake City in the matter of eliminating an existing nuisance created by the type of waste now flowing in this open ditch, in which waste originates from the Oil Refinery and the UPRR Co. shops area. This created nuisance and accompanying odors are the source of many complaints from property owners in the area and we feel that something must be done soon."

14. **Letter from Union Pacific to City Engineer - April 4, 1952.**

"As you undoubtedly know since our last meeting in Commissioner Christensen's office, it has been decided that we will construct a modern Diesel servicing plant replacing our existing round house and other mechanical facilities at Salt Lake City.

. . .

By discontinuing the servicing of steam power at Salt Lake City, we have eliminated practically all of the oil that was previously being conveyed through our various drain lines to the ditches west of our yard area. At the present time there is very little oil, or other contaminating substances being conveyed through these pipelines.

It is our intention to construct a Gale oil separator in connection with our new Diesel repair shop which when installed will eliminate any waste oil whatever getting into the ditches.

A recent survey also indicates that, of water entering into the ditches from the drain lines under our yard 75 % of same originates from springs or natural drains from streets and other properties located east of our yard, and is merely conveyed across our yard area and empties into ditches on the west side.

These several items has altered our status considerably as to the amount of contaminated substances we will be emptying into these ditches in the future, in view of which we prefer to withhold any commitment on participating financially in this venture of constructing pipe line for present."

15. **Letter to Union Pacific from City Engineer - August 14, 1952.**

"In reviewing the situation further . . . trying to cut costs in every way possible. The Utah Oil Refining Company has agreed to paricipate [sic] in this work to the amount set up in the estimate submitted providing the City would stand the cost of engineering and would eliminate the cost of connecting drain line . . . .

. . . .

Figuring on the same proportional cost as estimated the Utah Oil Company's cost amounts to $41,790.15; the Union Pacific Company's cost would be $18,865.08, the City of Salt Lake cost would be $29,132.27. Total cost is estimated at $89,737.50."

16. **Memorandum to Honorable Mayor Ted Wilson from Councilman Ronald Whitehead -- Subject: Summary of File 47-D-2 City Engineer**

Good summary of previously discussed documents. Also, has at the bottom a list of industries using the drainage system. "Incomplete: Jordan Fur and Reclamation, Utah Refining Company, Utah ice and Storage Company, Union Pacific Railroad, Cudahy Packing Plant, Salt Lake Refinery, Oregon Short Line Railroad, Old Copper Plant, and others yet to be discovered."

17. **Water Quality in the Sewage Canal, May 1976.**

"The Sewage Canal System evaluated in this study is made up of three canals: (1) sewage canal, (2) oil drain, (3) city drain. The Oil Drain and City Drain are tributary to the Sewage Canal. . .

. . . .

[p.2] Discharge from the Chevron Oil Refinery lagoons has a low flow (estimated at 0.7 cfs), but significant concentrations of coliform bacteria, BOD, and oil and grease (according to their discharge permit of May 20, 1971).

. . . .

Major diffuse source of pollution is probably the oil-saturated fill material forming the channel for the upper reaches of the oil drain. Oil rich sludge deposits that built up over the years in the lower reaches of the oil drain and in the city drain below the Salt Lake City Airport drain. These deposits apparently provide a source of oil loading to the system.

. . . .

[p.10] 5. Storm drain discharging to the oil drain near Station 16 (corrugated steel pipe).

The Union Pacific Oil treatment plant near 5th North at one time discharged to a small stream originating in that vicinity. The stream eventually flows into the oil drain above Station 10. Union Pacific now discharges to the sanitary sewer for treatment by Salt Lake City WWTP.

American Oil (Amoco) discharges to the sanitary sewer for treatment by Salt Lake City.

Husky Oil Company at one time discharged to a lagoon located just south of Cudahy Lane. They are currently discharging directly to the sanitary sewer for treatment by the South Davis WWTP.

. . . .

The water in the upper reaches of the oil drain runs over oil saturated fill. The bottom muds from Station 16 to the point of effluent discharge from the SLC WWTP are black and saturated with oil."

Report also contains much information on dissolved oxygen, BOD, organic carbon, oil and grease, various organic and inorganic compounds found in the water at various testing stations.

18. **Letter to Margo Nielson, EPA - Region VIII from E. J. Sullivan at Amoco - June 2, 1982.**

Attached are tables giving results of analyses on samples of oil and sludge from in and around the former dump site in Rose Park. The two sludge samples were collected last August . . .

. . . .

We intended, by these tests, to show that the material in the old canal was different from the material in the sludge pit, and that it was probably diesel lube draining from the railroad shops in the area. The data leave little doubt that all three materials are different, but they are not as conclusive as we had hoped in identifying the oil from the canal. Moreover, some of the data suggests the oil in the canal could have originated in the railroad shops. During the period that the canal was an actual surface drain, diesel lubricating oil additives contained barium, phosphorus, and sulfur. The oil sample from the canal contains all three of these elements. Concentrations of barium and phosphorus are significantly larger than in the sludge pit samples. Sulfur in the sludge pit samples ranged from about 25 per cent to nearly 150 per cent greater than sulfur in the canal oil. High sulfur will be expected in the sludge pit material since it is believed to be largely residue from the sulfuric acid treatment of light petroleum products.

One other metal in the canal oil that may be significant is lead at 360 ppm. Railroad journal-bearing lubricants are rich in lead salts, so the presence of lead in the oil further suggests a railroad operation as the source.

. . . .

Simulated distillation show that all samples have portions boiling in the lubricating oil/gas oil range.

. . . .

Diesel lube_stocks actually contain a significant portion boiling above 1,000 degrees Fahrenheit. These stocks are principally SAE 40 and SAE 50, which, as Appendix A shows, contain on the order of 15-25 percent hydrocarbons having 44 or more carbon atoms, and which boil in the 1,000+ degree F range."

19. **Sampling Plan, Rose Park Canals, Salt Lake and Davis Counties, Utah - September 9, 1989.**

[p.3] Prior to the closing of the Oil drain canal in the Rose Park area in the early 1950's, the canal received industrial waste, most notably from Utah Oil Refining Company and the Union Pacific Railroad yards . . . .

. . . .

Materials of concern are organic, oily and sewer waste sludges deposited directly into the canals. . . . An approximately 2 feet thick layer of dark oily sludge at a depth of about 4 feet has been documented at locations in Rose Park atop or adjacent to the Oil Drain canal. Sample analyses of the sludge indicate high concentrations of organics and metals, especially lead.

. . . .

[p.4] [T]he large oil drain canal was constructed [in the 1920's] to transport wastes further northward and deposit them in Farmington bay of the Great Salt Lake. This canal is still in use, although it has apparently been rerouted over many stretches. Complaints and concerns from residences of the newly constructed Rose Park Subdivision in the early 1950's caused the use of the canal to be discontinued in the area of Rose Park and resulted in plans to build a pipeline to transport the waste to a location further north in the canal. The costs for construction of this pipeline would be shared by Salt Lake City, Utah Oil Company and Union Pacific Railroad, based on their use of the canal."

20. **Utah Bureau of Environmental Response & Remediation, Field Activity Report, Rose Park Canals - September 27, 1990 (Revised January 17, 1991).**

Table 1, Sample Summary, includes several samples from Chevron property and D&RG properties.

21. **Incident Report - November 9, 1995.**

"On November 9, 1995, the Salt Lake City Water Reclamation Plant reported a petroleum odor invisible sheen on the canal that is adjacent to the treatment plant. Salt Lake City Public Utilities Drainage Division traced the draining system to Union Pacific yard. On November 11, 1995, Salt Lake City notified the Health Department of the release. On November 17, oil was pumped out of a manhole in the storm drain line on the Union Pacific Yard and the box was grouted.

. . .

Amoco Oil and Union Pacific agreed to cooperate in an effort to locate the source of petroleum release."

22. **Notes of meetings between Randy Petersen, Richard Flores, and Jerry Gordon.**

November 9, 1995

Discussion regarding petroleum smell in manhole in Box 5 and sampling done at a manhole located north of 9th North. This manhole turned out to be part of Amoco's collection system that conveys to the Salt Lake City collection system and ultimately to the POTW.

November 15, 1995

The collection system for the treatment process relating to Amoco/Union Pacific area was discussed:

". . .all parties agreed that the problem was in the line that runs through the Union Pacific yard."

23. **Letter from Craig W. Anderson to Joe Naccachi, Craig Morris of Amoco, and A. H. Jensen of Union Pacific - December 15, 1995.**

States that the petroleum release was first reported on November 9, 1995 and on November 17, 1995 oil had to be pumped out of a manhole in the storm drain line.

"Following the release, both Union Pacific and Amoco performed independent laboratory analysis of samples taken of the release. Based upon our discussion, it is my understanding that the analytical results are inconclusive regarding the exact source of the release.

. . . .

Amoco and Union Pacific agreed to cooperate in an effort to locate the source of the petroleum release and your respective consultants will work together and share any relevant existing information which may assist in the identification of the source."

24. **Summary-To-Date, Oil Contamination Site on Union Pacific Property, Jan 24, 1996.**

Gives a chronological time line of reporting and cleanup measures for November 1995 spill on Union Pacific property.

25. **Results of Investigation, 4/1/96**

"3) The next two boxes were located to and west of the Amoco facility located on 900 north and 500 west. These two boxes are on Amoco's storm drain system that flows into their treatment system. The odor was one of "gasoline" and not the characteristic "diesel" smell.

. . . .

6) We then asked the UPRR representatives about an "oily" Box that Ray and Wes had observed previously. They indicated that it was an abandoned line that used to serve the machine shops to the north and that it now drained into their collection system and did not tie into the storm drain across their property.

. . . .

12) "Box 7," located just east of the UPRR "wheel facility" and south west of Amoco's diesel storage tanks (#156 and #157), showed a rainbow sheen with a odor of diesel and some visible free product. UPRR indicated that the closest source of diesel to the box on UPRR's property was the engine fueling rack, located approximately 1000+ feet south of Box 7. . . . The UPRR individual also indicated that at one time there was a discharge from the fueling facility that according to Craig Morris of Amoco showed up in Box 7. They did not dispute Craig's indication.

. . . .

13) The next stop was at a box not shown on the Amoco map, dubbed "Box 7 1/2." The sheen in this box was increased, with a stronger odor and more visible product. It was noted that this box or Box 7 used to be connected to the storm sewer line that runs through Amoco's property, and was connected at a still visible elevated sewer box on Amoco's property near Monitoring Well MW-26 on the map.

14) The last stop on this line through UPRR property was at "Box 8" where the odor was very strong, the sheen dark purple with a pronounced rainbow. The longer it was observed at approximately 1645 hours, the heavier the sheen became. Possible sources that could be producing the sheen and free product were discussed, however, no firm conclusion was made."

26. **Letter to Robert Barnes of DEQ from Joe Naccache of Amoco - April 15, 1996.**

"This letter is to report to you Amoco's and Union Pacific's plans to stop the infiltration of groundwater contaminated with hydrocarbons into the city storm sewer located on Union Pacific's rail yard. Union Pacific and Amoco are jointly responding to this emergency.

. . . .

The hydrocarbon entering the stormwater sewer is of a distillate type (diesel) and its exact source has not yet been determined. The refinery already receives for treatment a similar type of water from Amoco service stations and marketing terminals as well as groundwater recovered from various refinery remediation systems."

27. **Salt Lake Tribune article - March 3, 1996.**

"Up to 50,000 gallons of diesel fuel have been leaking into an industrial storm drain near 800 West and 800 North since Feb. 21 . . . .

. . . .

'This has been going on, giving everybody headaches, for years.' Diamonte said. 'All we know is that it is diesel, similar to what the nearby rail yards lose.'"

28. **Letter from J.E. Naccache, Amoco, to Joyce M Ackerman, EPA, June 6, 1996.**

Describes hydrocarbon recovery systems and states "All the recovered groundwater and hydrocarbons are being sent to Amoco's wastewater treatment plant for pretreatment prior to discharge to the POTW."

29. **Site Investigation and Remediation Report, Union Pacific Railroad Company - July 22, 1996.**

"Project background representatives from Salt Lake, Union Pacific and Amoco discovered petroleum entering the storm sewer at Manhole No. 7 in early November 1995. On November 17, 1995, petroleum was pumped out of the manhole and the manhole was sealed with grout to prevent petroleum from entering the storm sewer. Amoco placed booms in the Oil Drain Canal and periodically monitored conditions in the canal to contain any further petroleum releases. The source of the petroleum was believed by the Health Department to be associated with past or current operations at the railroad yard or refinery."

[p.2] Describes separate incident on March 1, 1996. . . leak in Chevron's low sulfur diesel pipeline.

[p.5] "2.4 Diesel Tank Removal: The 500-gallon diesel underground storage tank located near the northeast corner of the Union Pacific One Spot Car Repair Shop was removed on April 25, 1996 by Professional Service Industries, Inc. (PSI). ERM observed the tank removal procedures and collected two samples of product floating on the ground water within the excavation during its removal (UP-UST-1 and UP-UST-2).

. . . .

According to Larry Roth, Union Pacific General Car Foreman, the diesel tank was removed from service during the early 1980's. However, the tank was returned to service for a seven month period (May to November 1995) to fuel maintenance equipment. Invoices show that the 4,167 gallons of diesel were placed in the tank during this period."

Report details several other incidents.

30. **Affidavit of Harry Patterson, dated December 13, 1996.**

"Manager, Environmental Site Remediation" for Union Pacific says, among other things, based on personal knowledge of Union Pacific operations:

"Basically, all fluids which are spilled or otherwise deposited within the confines of the facility, including spilled or dripped diesel fuel, used lubricating oil, used solvents, corrosion inhibitors, cooling water, wash-down water, and precipitation, are collected in the industrial waste water sewer system and conveyed to the facility's waste water treatment plant. . . Testing of the waste oil stream from railroad fueling/maintenance facilities reveals that, even when it consists predominately of diesel fuel, it is also contaminated with used lubricating oil, BTEX (benzene, toluene, xylenes) and other hazardous substances indicative of cross-contamination.

Drippage of degreaser/solvents used for parts cleaning purposes will be found wherever locomotives are repaired and maintained. Such spillage and drippage occurs routinely and by accident, even without any negligence or bad practices on the part of railroad employees. It is an inevitable byproduct of heavy industrial operations and large engine maintenance and repair. Used degreasers/solvents contain CERCLA hazardous substances, and (when spilled or dripped) make their way into the waste water collection and treatment system."

31. **Letter to H.P. Patterson, UPRR, from Raymond Farr, Amoco, January 22, 1997.**

More detailed discussion of oil in 900 North stormwater sewer system oil.

[p.5] "The system of recovery trenches addresses contamination that the investigation clearly revealed the primary source to be the leaking UPRR underground storage tank."

32. **Letter from TriTechnics Corp to H.P. Patterson, January 28, 1997.**

"In this data supplement, groundwater contour, benzene concentration, and refienery flow path maps used during our presentation of findings on December 3, 1996, are shown in Figures 1 through 4. " Also includes groundwater elevation data in figure 5 and gas chromatograms of LNAPL and free product from the UPRR underground tank excavation in figure 6.

33. **Letter to Mr. Steven Goodsell, UPRR from S.G. Horsfield, Amoco, March 19, 1997.**

"Our consultant's report showed hydrocarbons south of the sewer to be similar to the material in the UP underground storage tank. It appears releases from the UP underground storage tank entered the sewer system in the area between Manholes 7 1/2 and 8, where the sewer had no bottom. Hydrocarbons north of the sewer at the fenceline are not similar to the material in the underground storage tank.

. . . .

The system along the storm sewer in UP's yard provides Union Pacific with both short and long-term benefits, but provides little benefit to Amoco since it addresses contamination from Union Pacific's underground storage tank."

34. **Email (?) to Rick L. Eades, Lanny A. Schmid, From Ken R. Welch - May 9, 1997.**

"At midnight on Sunday the 4th of May, manager Chemical Transportation Safety, Harry W. Rudebach was notified by the on-duty MTO at Salt Lake City, Utah regarding a diesel fuel leak from a tank car at UP 70163. I was advised that the car had been leaking for some time and they had attempted to notify me one week earlier, but had failed to make contact.

. . . .

When I received notification, I immediately responded to the yard and found the tank car leaking and evidence of a major spill.

My investigation revealed the car had a bad order notice attached, dated 9:00 a.m., 4/13/97 from Mr. Rudy Sanchez of Amoco Oil indicating the car had a cracked bottom outlet valve and the tank was not secured to the underframe of the car. Visual inspection disclosed that the bottom outlet valve had been sheered off and one of the straps that tied the tank to the underframe was broken and had been secured in place with a bungee cord to prevent a safety hazard. All the bolts that secure the tank onto the underframe had been sheered off and the tank was found with two holes in the bottom adjacent to the outlet valve, approximately the size of dimes.

Investigation is continuing to determine why Amoco loaded a car in bad order condition, and released it for transportation, and to determine when the tank actually began to leak."

35. **Letter to H. P. Patterson from Joyce Ackerman at EPA - July 8, 1997.**

Requires Union Pacific to submit: (1) a detailed description of the 1997 release, (2) a list of all historical petroleum spills in the rail yards, and (3) workplans for any proposed remedies.

36. **Letter to H. P. Patterson of Union Pacific from Raymond Farr, Amoco Remediation Services - October 27, 1997.**

"In summary, the product characterization data show that the product and subsurface between the UPRR yard is relatively fresh and matches the product samples collected from the city storm sewer. Product entering recovery system RS 203 at the Amoco Refinery is more biodegraded from longer residence time in the subsurface or greater travel time from the likely source of UPRR yard. Monitoring well samples from Amoco's fenceline show that fresh diesel has reached the front fenceline from the upgradient source in the UPRR yard and may be mixing with more degraded products between the fenceline and the recovery system. Based on known groundwater elevations and contours, it is likely that railroad diesel from the source of the UPRR yard is now moving on Amoco's refinery."

37. **Site Activity Report - July 10, 1998.**

Discusses releases from Union Pacific in Background section 2.0. For example:

"During this investigation of petroleum plume, consisting of weathered gasoline, 20 percent in diesel, 80 percent was identified within the railroad yard. The plume within the railroad yard was believed to be a source of petroleum observed within the storm sewer and the oil drain canal during March 1997. However, the sources of the product in the railroad yard were not specifically determined."

38. **Letter to David L. Broste from Thomas E. Greenland - August 5, 1999.**

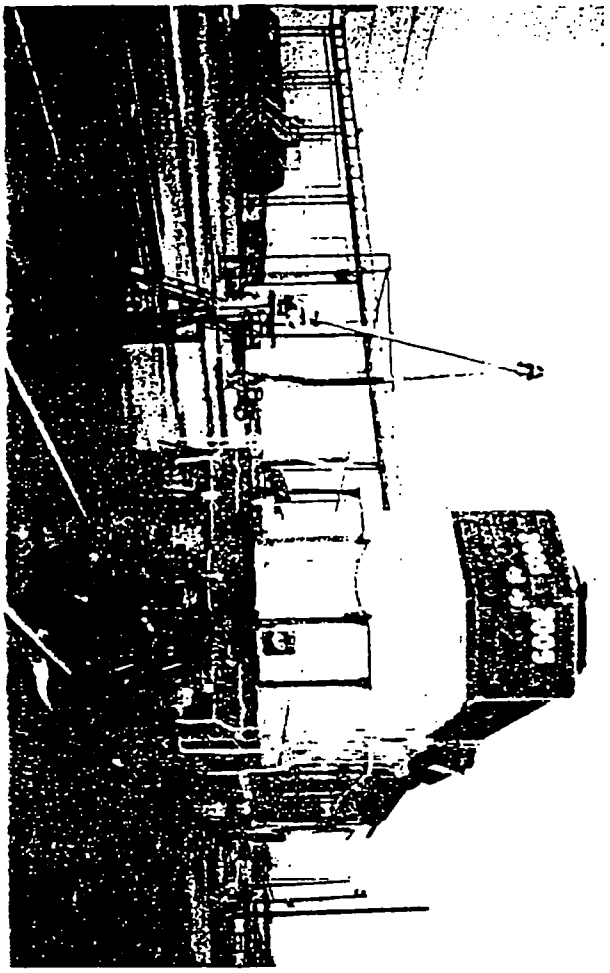
"Attached please find the response of Union Pacific Railroad Company to their request for information initially submitted to Dennis Barley."

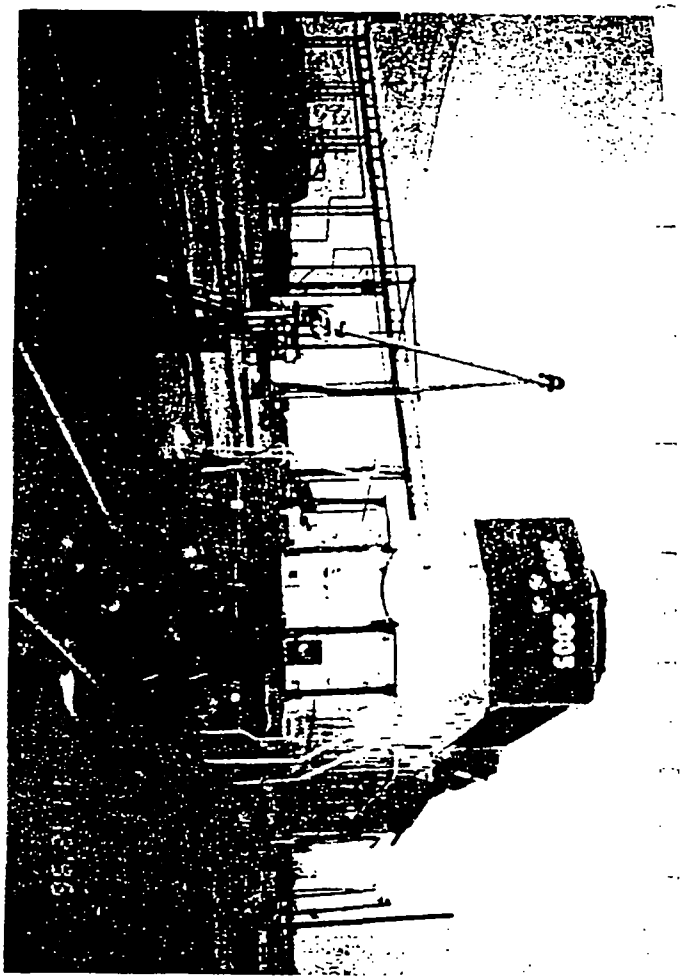
Contains several responses to questions that may be pertinent to the issue. For example:

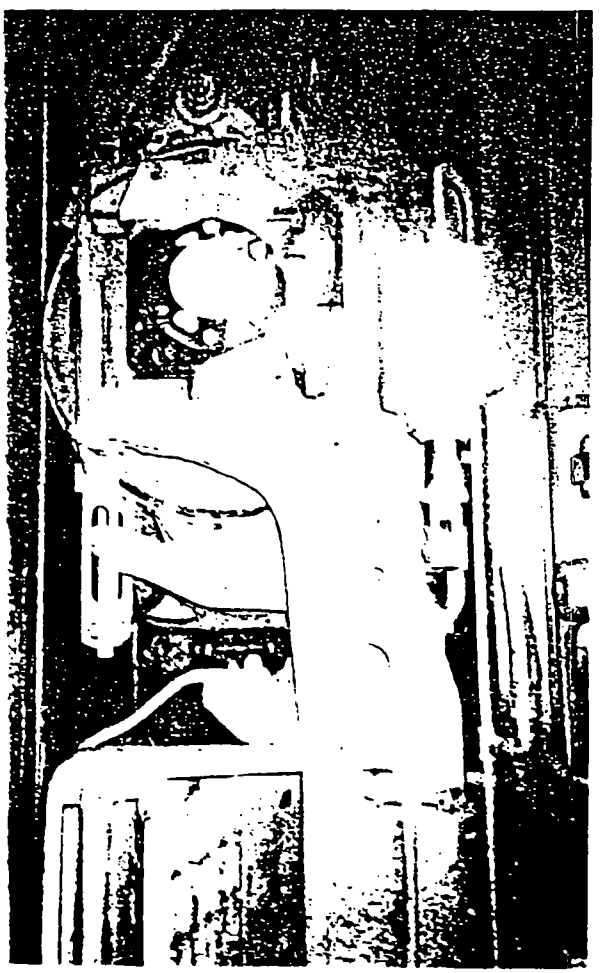
"Union Pacific Railroad Company's successor in interest to Oregon Short Line and Denver & Rio Grande Western Railway."

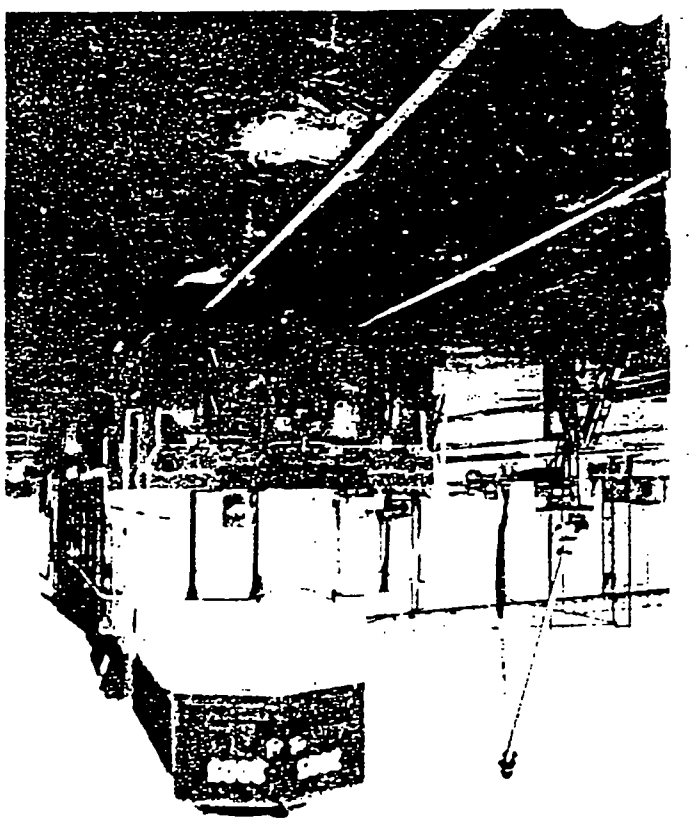
39. **Department of Transportation Hazardous Materials Incident Reports for Union Pacific (1990-1997).**

Incident reports of leaks at Union Pacific for everything from oil to sulfuric acid to radioactive material.

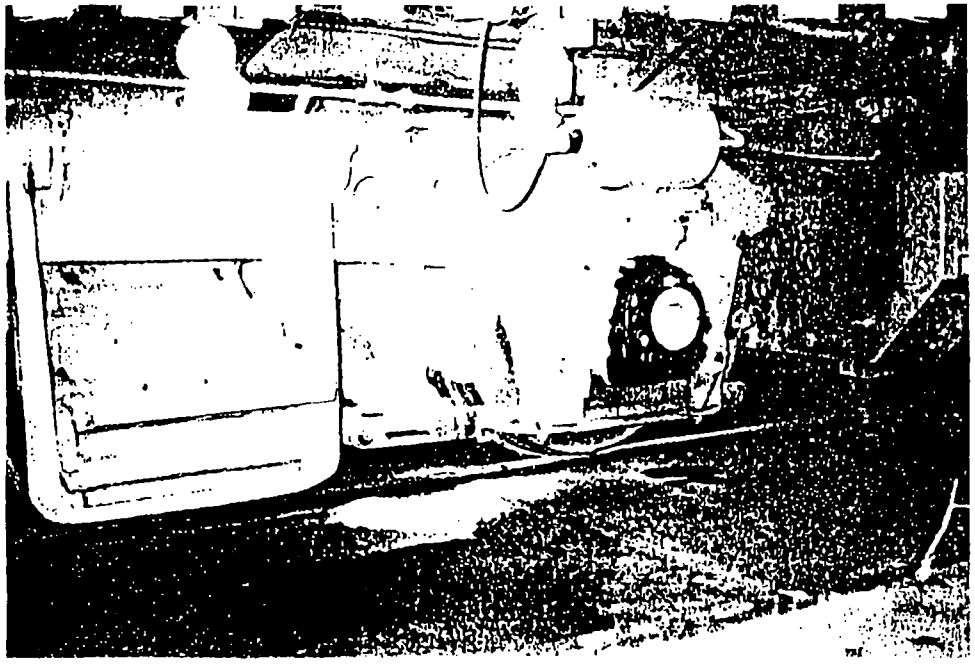


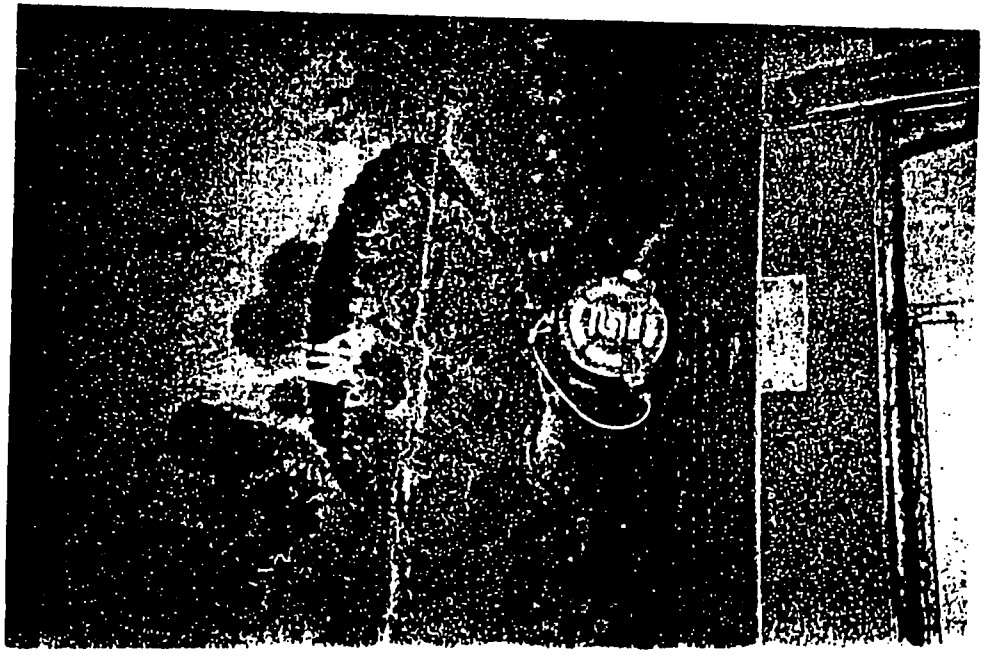


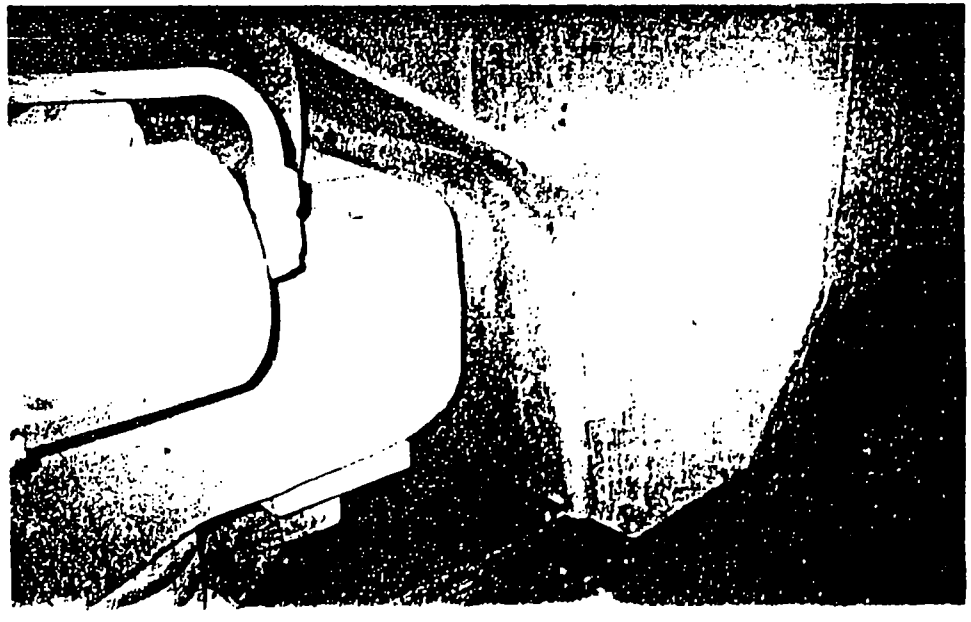


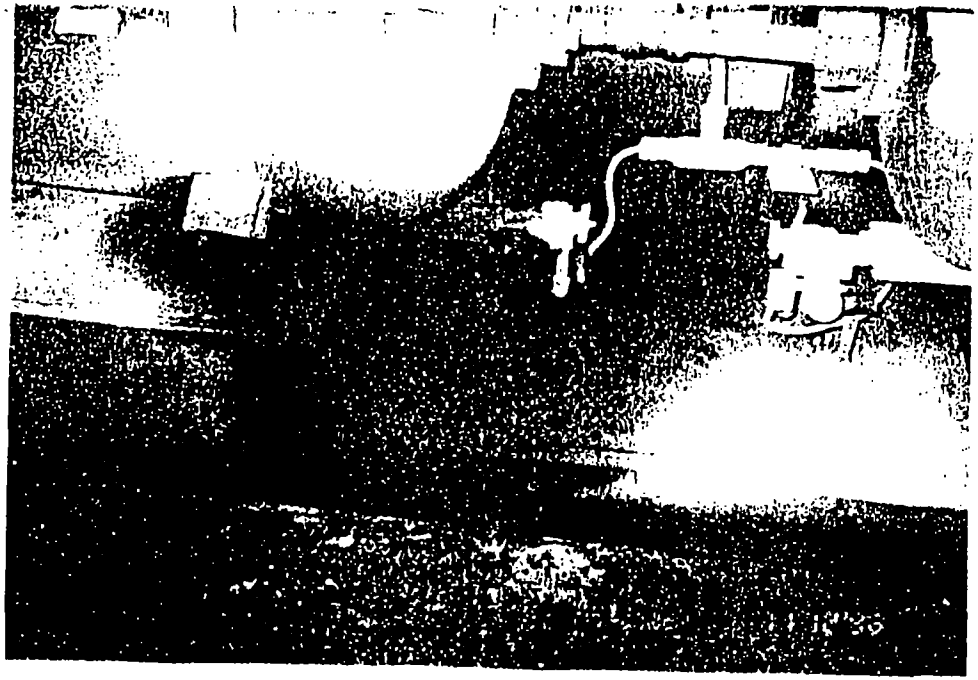


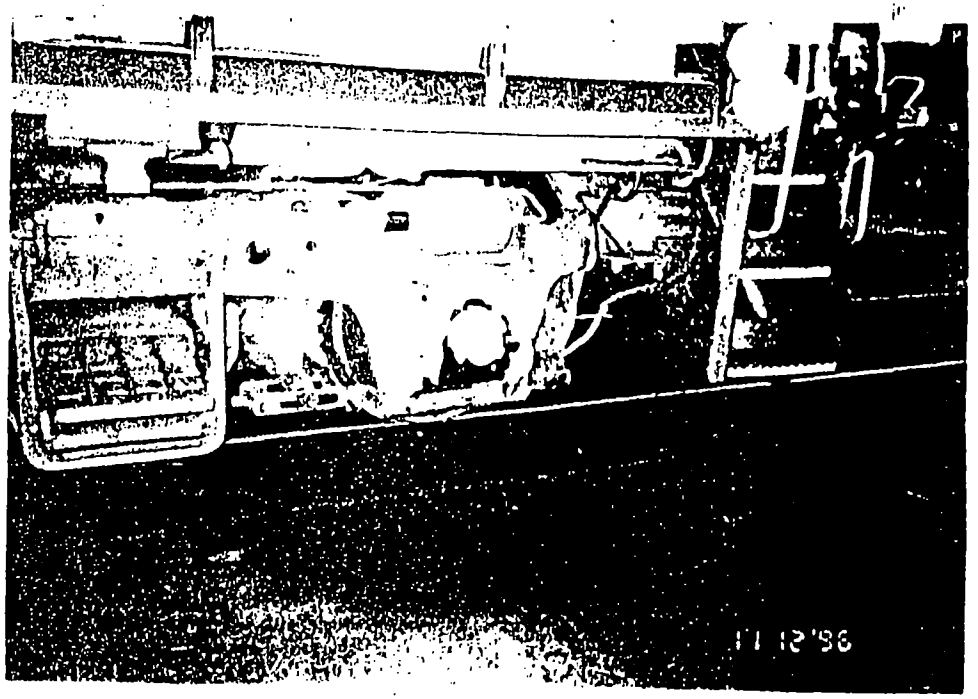
ATTACHMENT 1







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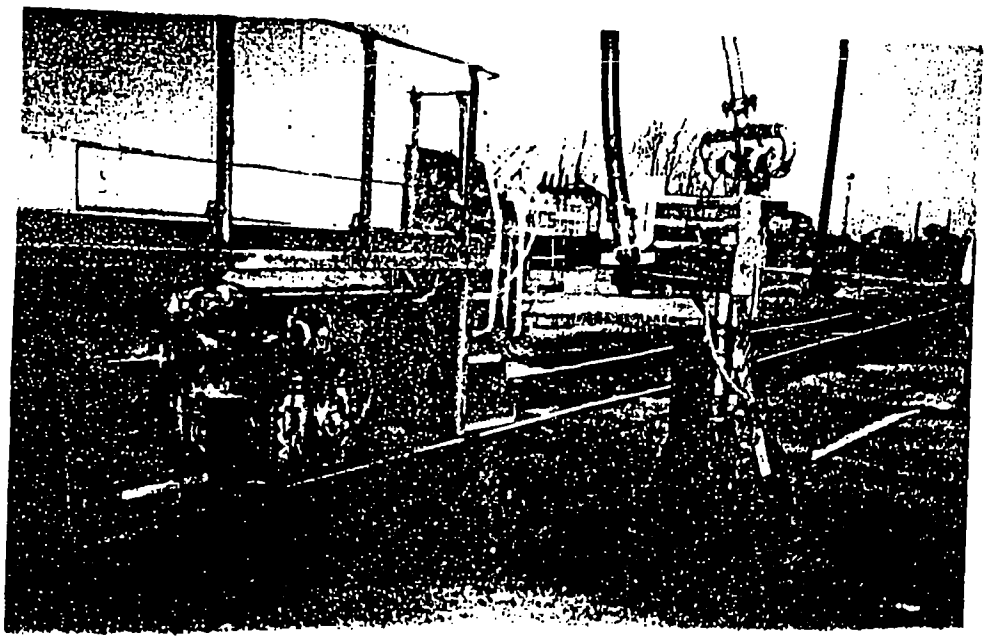
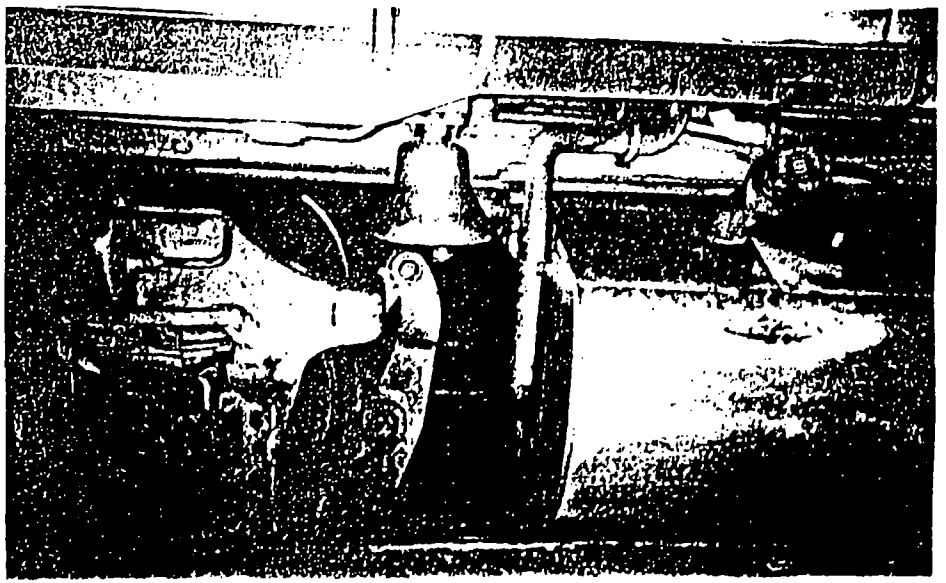
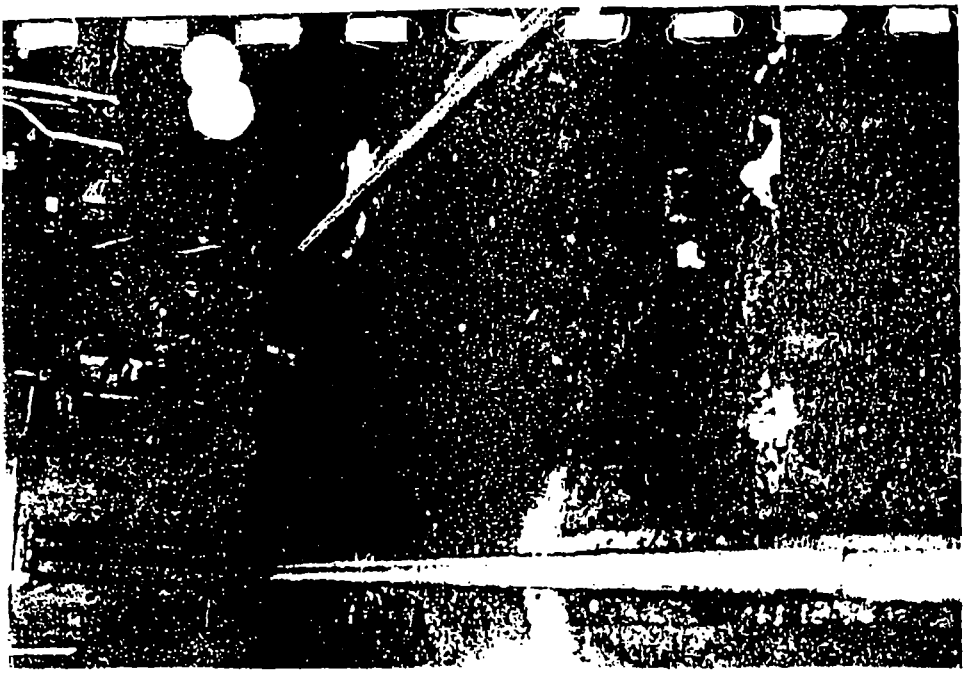
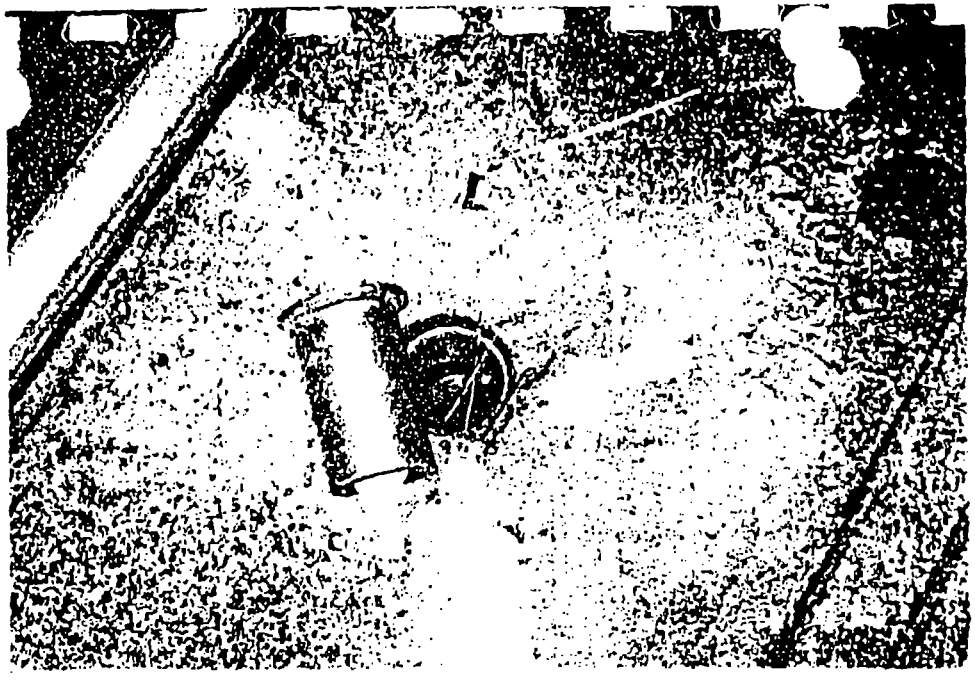
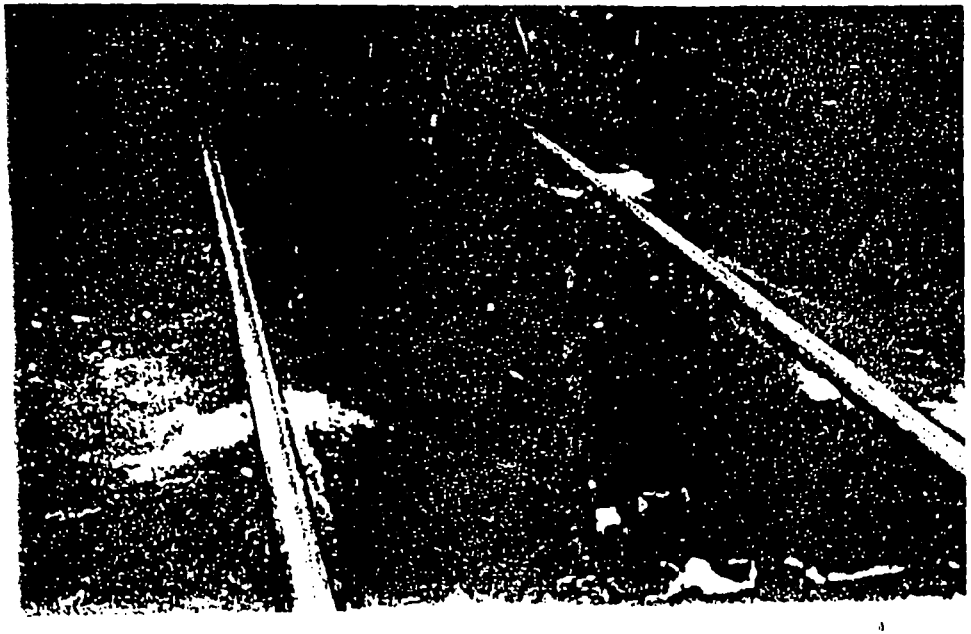
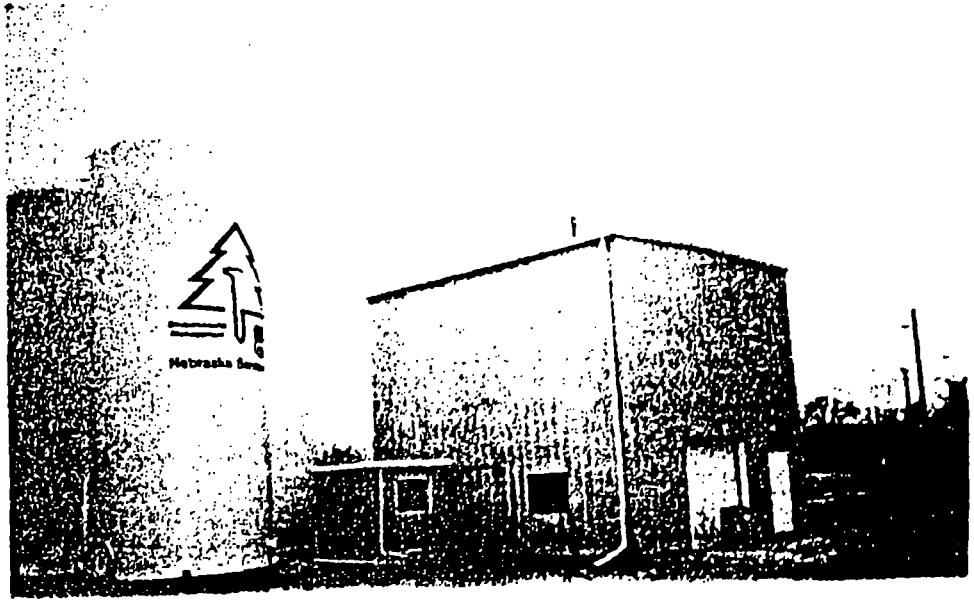


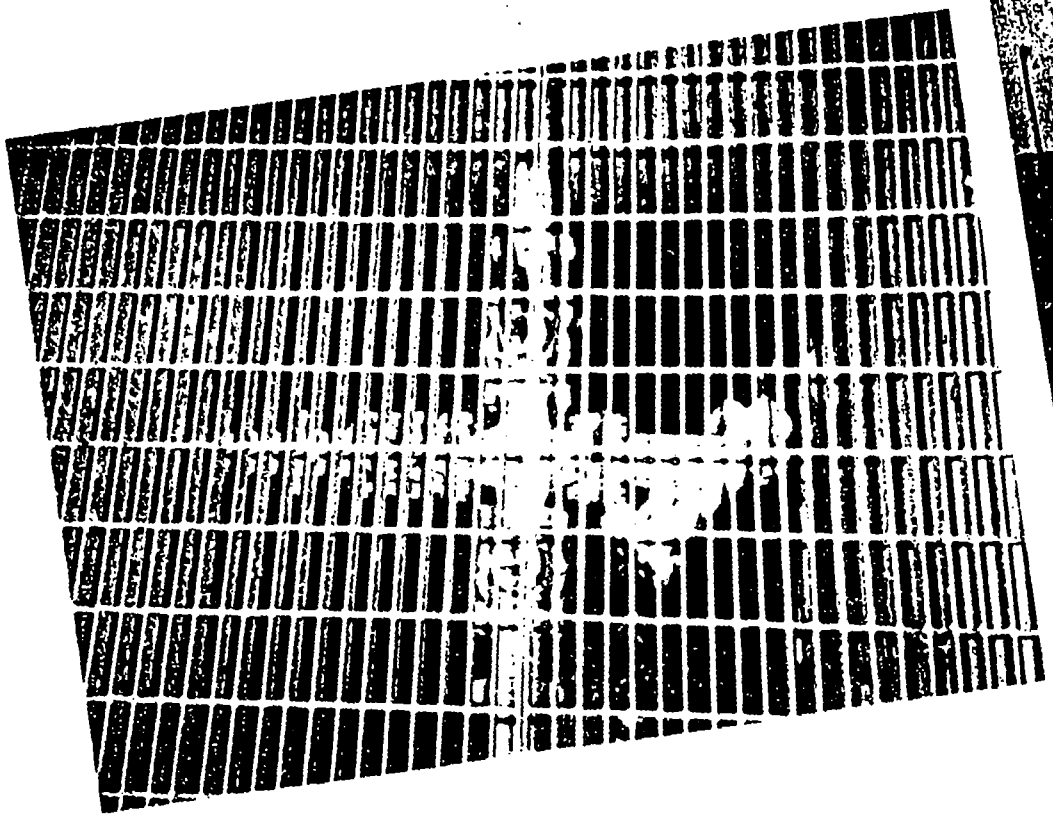


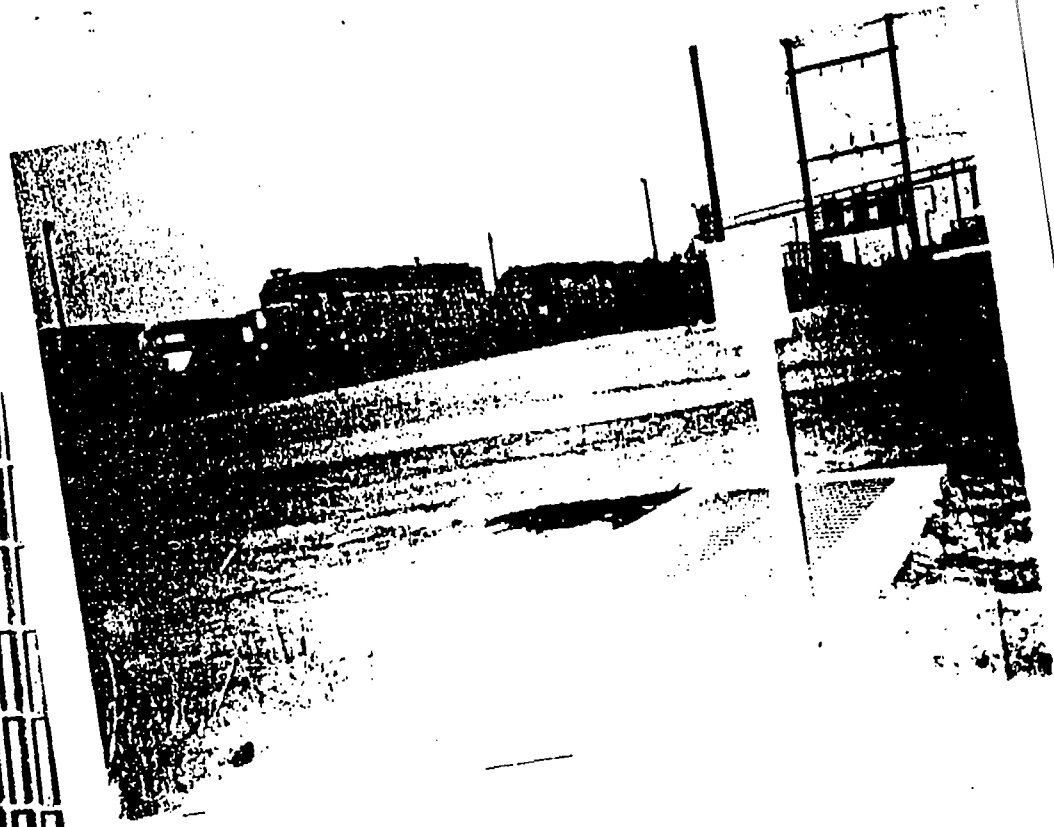


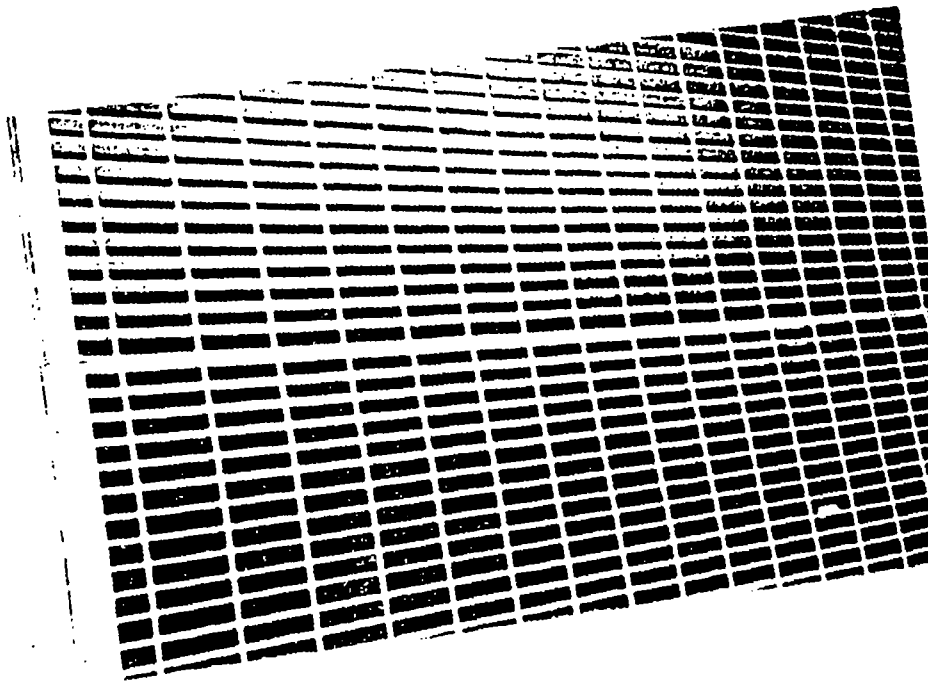












UNION PACIFIC RAILROAD COMPANY

SPECIFICATION C.S. 26-D DIESEL FUEL OIL (ASTM D-975)

GENERAL STATEMENT

This specification covers two fuel grades: No. 1-D for small diesel engines (Min. 45 Cetane) and No. 2-D for diesel locomotives (Min. 40 Cetane).

The fuels shall be free from grit, acid, microbial growth, and fibrous or other foreign material likely to clog pipes and strainers or damage injectors. In addition, the fuel should pass EMD Filtration Cleanliness Test - M.I. 1750.

The fuels in this specification shall be stable as listed under service requirements in engine operation and storage.

REJECTION

Any samples of fuel delivered failing to meet these specifications shall be rejected and shipment returned to manufacturers, who shall pay the freight both ways.

PHYSICAL REQUIREMENTS

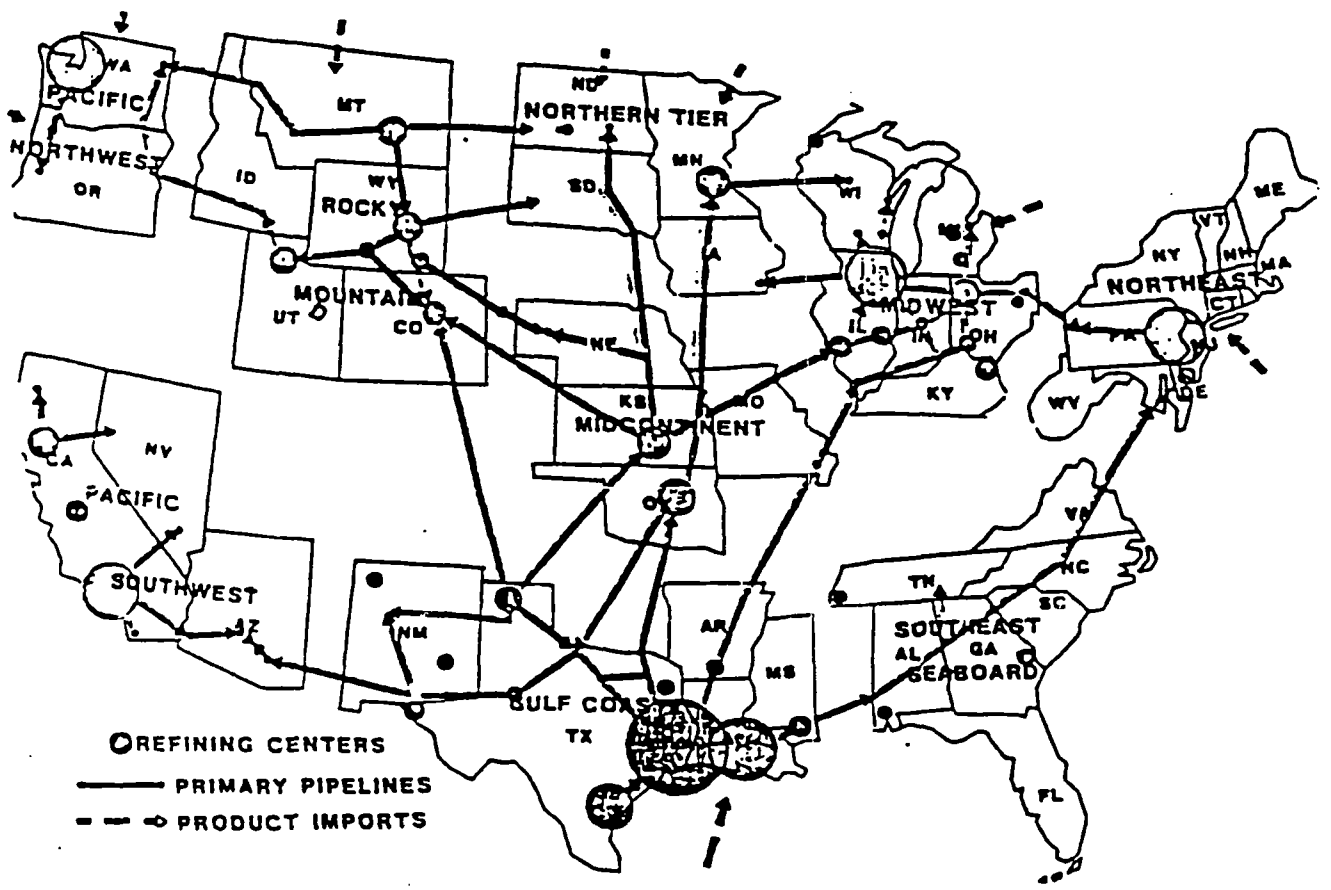
	ASTM Test Method	No.1-D	No. 2-D
Flash, °F, Min.	D93	100	125
Water & Sediment, Vol. % Max.	D1796	0.05	0.05
Carbon Residue 10% Bot. Max.	D524	0.15	0.35
Ash, Wt.% Max.	D482	0.01	0.01
Distillation, IBP Min. (2)	D86		350
10 Max. (2)		425	
90 Max.		540	640
EP Max. (2)		600	700
Recovery, Min. % (2)		99	99
Vis. SUS @ 100°F Min.	D88	30.5	32.6
Max.		34.4	40.1
Sulfur Wt. % Max. (3)	D1552	0.50	0.50
Copper Strip Corrosion, Max. 3 hours @ 212°F.	D130	No. 3	No. 3
Cetane No. Min.	D613	45(4)	40
Cloud Point °F Max.	D2500	S E E	T A B L E
Pour Point °F. Max.	D97	S E E	T A B L E
API Gravity (2)	D287	35-45	30-40

ATTACHMENT 2

TABLE 1

CLOUD & POUR POINT REQUIREMENTS

Region	SUMMER (March 1 to October 31) Cloud Point	SUMMER (March 1 to October 31) Pour Point	WINTER (November 1 to Febr. 28) Cloud Point	WINTER (November 1 to Febr. 28) Pour Point
Pacific Northwest	+25	+20	+12	-30
Pacific Southwest	+25	+20	+12	-10
Rocky Mountain	+36	10	+12	-30
Mid-Continent	+14	10	+12	-20
North Platte	+14	0	+12	* 0
Midwest	+15	0	+ 5	-20
Gulf Coast	+20	10	+12	0



* Pour Point Depressant is added by railroad at North Platte to -30°F

SERVICE REQUIREMENTS

Fuels may contain stabilizing and metal deactivating additives approved by the General Research & Development Engineer in order to meet requirements.

Use of any additive that contributes to pollution of the air and is in violation of State or Federal regulations in the railroad operating area is prohibited.

All fuels shall be stable and shall be compatible with other conventional grades of diesel engine fuel oil.

A maximum rating of 5 is required for acceptance of the fuel oil when tested according to the Modified Union Pacific 300°F, 90-Minute Stability Test.

PIPELINE DELIVERIES

In addition to fulfilling other requirements, fuel oil delivered by pipeline shall be treated with sufficient corrosion inhibitor to produce a NACE rating of B++.

NOTES:

(1) Minimum allowable flash point is not valid if any legal standard specifies higher limit for state in which oil is delivered.

(2) Additional requirements not part of ASTM D-975.

(3) Maximum allowable sulfur is not valid if any legal standard specifies a lower limit for the state in which the oil is delivered.

(4) More stringent than ASTM D975.

Office of
General R&D Engineer

March 5, 1990

SUMMARY REPORT

CLIENT : Union Pacific Railroad
PROJECT : N. Little Rock WWTP

JOB NUMBER : D96-4628
REPORT DATE : 8-MAY-1996

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	Waste Oil (oil tank)	Oil	30-APR-1996

BTEX ANALYSIS, EPA 8020		1			
Benzene	µg/Kg	< 2000			
Toluene	µg/Kg	6400			
Ethyl benzene	µg/Kg	17200			
Xylenes	µg/Kg	104000			
BTEX (total)	µg/Kg	128000			

TPH BY GC EXTENDED RUN (EXTRACTABLE), EPA 8015M		1			
Total Petroleum Hydrocarbons	mg/Kg	210000			

WATER BY GC, EPA 8000		1			
Water	%	58.2			

SUMMARY REPORT

CLIENT : Union Pacific Railroad
PROJECT : Los Angeles WWTP

JOB NUMBER : D96-4143
REPORT DATE : 25-APR-1996

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	Waste Oil #1 Top	Oil	16-APR-1996
2	Waste Oil #2	Oil	16-APR-1996

BTEX ANALYSIS, EPA 8020		1	2		
Benzene	µg/Kg	< 10000	< 10000		
Toluene	µg/Kg	< 10000	< 10000		
Ethyl benzene	µg/Kg	< 10000	< 10000		
Xylenes	µg/Kg	20900	12500		
BTEX (total)	µg/Kg	20900	12500		

TPH BY GC EXTENDED RUN (EXTRACTABLE), EPA 8015M		1	2		
Total Petroleum Hydrocarbons	mg/Kg	668000	684000		
Product ID		Diesel	Diesel		

WATER BY GC, EPA 8000		1	2		
Water	%	10.2	< 0.1		

SUMMARY REPORT

CLIENT : Union Pacific Railroad
PROJECT : FT. Worth WWTP

JOB NUMBER : D96-3976
REPORT DATE : 22-APR-1996

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	Waste Oil	Oil	15-APR-1996

BTEX ANALYSIS, EPA 8020		1			
Benzene	µg/Kg	< 10000			
Toluene	µg/Kg	73000			
Ethyl benzene	µg/Kg	105000			
Xylenes	µg/Kg	749000			
BTEX (total)	µg/Kg	927000			

TPH BY GC EXTENDED RUN (EXTRACTABLE), EPA 8015M		1			
Total Petroleum Hydrocarbons	mg/Kg	678000			

WATER BY GC, EPA 8000		1			
Water	%	< 0.1			

SUMMARY REPORT

CLIENT : Union Pacific Railroad
PROJECT : Marshalltown-WWTP

JOB NUMBER : D96-3874
REPORT DATE : 19-APR-1996

SAMPLE NO.	ID MARKS	MATRIX	DATE SAMPLED
1	Marshalltown	Oil	9-APR-1996

TPH BY GC EXTENDED RUN (EXTRACTABLE), EPA 8015M		1			
Total Petroleum Hydrocarbons	mg/Kg	780000			
Product ID		Deisel and Lub. Oil Mix			

WATER BY GC, EPA 8000		1			
Water	%	< 0.1			

ASSOCIATED LABORATORIES

TOXICITY BIOASSAY

Lab No. RS0558

Date Received: 05/07/96
Date Reported: 05/13/96

Bioassay Type
Static X Continuous
Screening X Definitive

Report To: Weck Laboratories, Inc.
Attn: Alfredo Pierri
14859 E. Clark Ave.
City of Industry, Ca 91745

Sample Description: Oil - Sample ID #9600374 Date Collected 05/05/96 @ None Given
Test Organism Pimephales Promelas Source Thomas Fish Farm Acclimatization 25 Days 6 20 deg. C
Aquaria Volume 10 liters Aquaria Depth 5.0 Inches No. Fish/Concentration 10 Total Chlorine Residual N/D Sample Conductivity 200 umhos/cm
Organism Characteristics Length (mm) Min 32 mm Max 35 mm Avg 34 mm Weight (gm) Min 0.65 gm Max 0.70 gm Avg 0.67 gm
Dilution Water Source None Hardness - Initial 40 mg/l Final 60 mg/l Alkalinity - Initial 30 mg/l Final 45 mg/l
Aeration Air Control Hardness Initial: 40 mg/l Final: 50 mg/l Control Alkalinity Initial: 30 mg/l Final: 35 mg/l Control Conductivity 120 umhos/cm

Bioassay Conditions	Date Time	Control		Dilution 750 mg/l		500 mg/l		250 mg/l		750 mg/l		500 mg/l		250 mg/l	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Organisms Surviving	05/09	10	100	10	100	10	100	10	100	10	100	10	100	10	100
	05/10	10	100	2	20	6	60	10	100	3	30	6	60	10	100
	05/11	10	100	0	0	3	30	10	100	0	0	4	40	10	100
	05/12	10	100			2	20	9	90			2	20	9	90
	05/13	10	100			2	20	9	90			2	20	9	90
Dissolved Oxygen mg/l	08:40	6.0		6.1		6.1		6.1		6.1		6.1		6.1	
	09:00	7.1		7.0		7.2		7.4		7.0		7.2		7.4	
	09:30	7.4				7.5		7.6				7.5		7.6	
	09:20	7.2				7.4		7.5				7.4		7.5	
	09:30	7.5				7.0		7.2				7.0		7.2	
pH / Temp	Start	6.8	21°C	7.3	21°C	7.2	21°C	7.2	21°C	7.3	21°C	7.2	21°C	7.2	21°C
	24 HR	6.9	21°C	7.4	21°C	7.3	21°C	7.3	21°C	7.4	21°C	7.3	21°C	7.3	21°C
	48 HR	6.9	21°C		21°C	7.4	21°C	7.3	21°C		21°C	7.4	21°C	7.3	21°C
	72 HR	6.9	21°C		21°C	7.4	21°C	7.3	21°C		21°C	7.4	21°C	7.3	21°C
	96 HR	6.9	21°C		21°C	7.4	21°C	7.3	21°C		21°C	7.4	21°C	7.3	21°C

Results - LC_{50} = 377 mg/l
377 mg/l
% Survival N/A
Toxicity Units T.U. N/A
Observation/Remarks

Method of Calculations EPA Program LC50
95% Confidence Limits N/A
LC_{50} Method Moving Average

Laboratory Supervisor

806 North Batavia · Orange, California 92668 · 714/771-6900

Weck Laboratories, Inc.
Analytical & Environmental Services

Client: Union Pacific Rail Road
5500 Ferguson Drive
Los Angeles, CA 90022

Report Date: May 23, 1996
Received Date: May 06, 1996
Monday 15:03/TGN

Attn.: Mr. Robert Johnson (213) 725-2340 x **FAX** (402) 271-3461

Project Name: WWTP **Project #:**
Purchase Order #: Audit 177019 Normal Turnaround

Certificate of Analysis

Lab#: 9609374 **Sample ID:** Waste Oil **Matrix:** Oil
Sampled By: Robert Johnson **Date:** 05/06/1996 **Time:** 13:00

Parameter	Result	Units	PQL	Method	Analyzed	Tag #
Fish Biomassay	377	mg/L		Sub-Contract	05/09/1996	96069413
Antimony	ND	mg/Kg	5	EPA 6010	05/13/1996	96069404
Arsenic	ND	mg/Kg	5	EPA 6010	05/13/1996	96069404
Barium	ND	mg/Kg	0.7	EPA 6010	05/13/1996	96069404
Beryllium	ND	mg/Kg	0.7	EPA 6010	05/13/1996	96069404
Cadmium	ND	mg/Kg	0.7	EPA 6010	05/13/1996	96069404
Chromium, Total	ND	mg/Kg	1.5	EPA 6010	05/13/1996	96069404
Copper	ND	mg/Kg	1.5	EPA 6010	05/13/1996	96069404
Cobalt	ND	mg/Kg	2.5	EPA 6010	05/13/1996	96069404
Molybdenum	ND	mg/Kg	2.5	EPA 6010	05/13/1996	96069404
Nickel	ND	mg/Kg	2.5	EPA 6010	05/13/1996	96069404
Silver	ND	mg/Kg	0.7	EPA 6010	05/13/1996	96069404
Vanadium	ND	mg/Kg	2.5	EPA 6010	05/13/1996	96069404
Zinc	3.31	mg/Kg	1.5	EPA 6010	05/13/1996	96069404
Mercury	ND	mg/Kg	0.07	EPA 7471	05/11/1996	96069305
Flash Point (Closed Cup)	> 200	Degrees F		EPA 1010M	05/20/1996	96069515
pH	6.08	Units		EPA 9045	05/14/1996	96069377
Total Releasable Hydrogen Sulfide	ND	mg/Kg	2	Sec 7.3.4	05/16/1996	96069507
Total Releasable Hydrogen Cyanide	ND	mgHCN/Kg	0.25	Sec 7.3.3	05/16/1996	96069506
Water Compatibility	no reaction			ASTM D5058 C	05/21/1996	96069524
Water Content (Karl Fisher)	1.04	% w/w	0.15	ASTM E203	05/08/1996	96069190
Lead	ND	mg/Kg	1.5	EPA 7420	05/14/1996	96069367
Thallium	ND	mg/Kg	1.5	EPA 7840	05/14/1996	96069368
Selenium	ND	mg/Kg	0.2	EPA 7741	05/17/1996	96069456

ND = Not Detected
PQL = Practical Quantifiable Limit
e = Estimated (> MDL, but < PQL)

Authorized Signature

Any remaining sample(s) for testing will be disposed of three weeks from the final report date unless other arrangements are made in advance.

Weck Laboratories, Inc.

Analytical & Environmental Services
Serving the industry since 1954

Client: Union Pacific Rail Road
833 East 8th Street
Stockton, CA 95207

Report Date: September 13, 1995

Received Date: September 13, 1995
Wednesday 09:[illegible]

Attn.: Jim Gorley x FAX

Project Name:

Project #:

Purchase Order #: Audit 177019 Normal Turnaround

Certificate of Analysis

Lab#: 9517968 **Sample ID:** Waste Oil **Matrix:** Oil
Sampled By: **Date:** 08/30/1995 **Time:** 14:00

Parameter	Result	Units	MDL	Method	Analyzed	Batch
Benzene	2.3	mg/kg	0.25	EPA 8020	09/14/1995	95102096
Toluene	58	mg/kg	13	EPA 8020	09/14/1995	95102096
Ethyl Benzene	150	mg/kg	13	EPA 8020	09/14/1995	95102096
m/p-Xylenes	430	mg/kg	13	EPA 8020	09/14/1995	95102096
o-Xylene	200	mg/kg	13	EPA 8020	09/14/1995	95102096

ND = Not Detected
MDL = Method Detection Limit

Authorized Signature

14859 East Clark Avenue Industry, California 91745-1395 (818) 336-2139 FAX (818) 336-2634

Weck Laboratories, Inc.

Analytical & Environmental Services
Serving the Industry since 1964

Client: Union Pacific Rail Road
833 East 8th Street
Stockton, CA 95207

Report Date: September 03, 1996
Received Date: September 01, 1996

Attn.: Jim Gorley FAX

Project Name: **Project #:**
Purchase Order #: Avail [illegible] RUSH Turnaround

Certificate of Analysis

Lab#: 9517202 **Sample ID:** Waste Oil **Matrix:** Oil
Sampled By: **Date:** 08/30/1996 **Time:** 14:00

Parameter	Result		Units	Method	Analyzed	Ref #
Total Petroleum Hydrocarbons as Diesel	94.7	84%	mg/kg	EPA 8015M	09/05/1996	9517202
TPH C6 - C10	1.58	1.8%	mg/kg	EPA 8015M	09/05/1996	9517202
TPH C10 - C20	81.2	81.2%	mg/kg	EPA 8015M	09/05/1996	9517202
TPH C20 - C36	2.04	2.04	mg/kg	EPA 8015M	09/05/1996	9517202

ND = Not Detected
MDL = Method Detection Limit

Authorized Signature

Post-it Fax Note [illegible]

14859 East Clark Avenue, Industry, California 91745-1396 (818) 336-2139 FAX (818) 336-2634

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(801) 595-7800

Paul D. Phillips, Esq.
Denise W. Kennedy, Esq.
Steven W. Black, Esq.
M. Terry Fox, Esq.
HOLLAND & HART LLP
555 17th Street, Suite 3200
Post Office Box 8749
Denver, Colorado 80201-8749
(303) 295-8000

ATTORNEYS FOR PLAINTIFF
THE EKOTEK SITE PRP COMMITTEE

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF UTAH, CENTRAL DIVISION

THE EKOTEK SITE PRP COMMITTEE, an unincorporated association,	)	Civil Action Nos. 2:94-CV-277K
Plaintiff,	)	**AFFIDAVIT OF HARRY PATTERSON**
vs.	)	
STEVEN M. SELF, et al.,	)	
Defendants,	)	

STATE OF NEBRASKA)
) ss.
County of Douglas)

I Harry Patterson, having been duly sworn, state the following under oath:

1. I am over 18 (eighteen) years of age and have personal knowledge of the facts stated herein.

2. I am a resident of Douglas County, State of Nebraska.

3. My Expert Report dated December 9, 1996, included here as Attachment 1, accurately represents my expert opinion and I hereby incorporate that report as my sworn testimony.

I have read the foregoing and affirm that it is true and correct to the best of my knowledge and information.

DATED this 13th day of December, 1996.

Name: Harry Patterson

The foregoing instrument was acknowledged before me this 13 day of December, 1996, by Harry Patterson.

Witness my hand and official seal.

My commission expires: 12-5-99

GENERAL NOTARY-State of Nebraska
ROBERT F. ANDERSON
My Comm. Exp. Dec. 5, 1999

Notary Public

1416 Dodge St

Address of Notary

Omaha Ne 68179

Attachment 1:
Expert Report of Harry Patterson

STATEMENT OF OPINIONS
HARRY P. PATTERSON, P.E.
MANAGER ENVIRONMENTAL SITE REMEDIATION
UNION PACIFIC RAILROAD
RELATING TO THE EKOTEK SUPERFUND SITE
SALT LAKE CITY, UTAH

Prepared for
The Ekotek Site PRP Committee
December 9, 1996

Re: The Ekotek Site PRP Committee v. Steven M. Self, et al., No. 2:94-CV-277L

EXPERT WITNESS REPORT – EKOTEK SITE
(December 9, 1996)

INTRODUCTION

My name is Harry P. Patterson. The Ekotek Site PRP Committee (the "Committee") has requested my assistance in identifying the sources and nature of contamination at railroad facilities, in particular fueling and maintenance facilities. To do so, I have relied on my 26 years of experience in the railroad industry. I have personally observed approximately 100 fueling facilities owned by Union Pacific Railroad and other railroads throughout the United States. I am very familiar with the operations at railroad fueling and maintenance facilities.

I obtained a Bachelor of Science degree in Mechanical Engineering from the University of Nebraska. My current position is Manager, Environmental Site Remediation, for Union Pacific Railroad ("UP"). I also served as Manager, Energy and Environmental Systems with Union Pacific Railroad from 1976 through 1986. In that capacity, one of my responsibilities included diesel fuel, conservation, diesel fuel spill reduction and diesel fuel inventory control. Part of my job was to assess and address fuel spillage issues. Between 1990 and 1991, I was Director of Environmental Operations (West) for Union Pacific Railroad. In that capacity I oversaw industrial wastewater treatment, including the handling, treatment, and disposition of spilled diesel fuel, used lubricating oil and other waste materials at railroad fueling and maintenance facilities in a number of western states. Over the course of my career, I have worked on these issues, not just for UP but also for other affiliated railroads, including the Denver & Rio Grande, Southern Pacific, Missouri Pacific, and the Missouri, Kansas, Texas Railway. My opinions expressed below are based on my experience and observations at a large number of different fueling and maintenance facilities operated by different railroads in a number of states. Based on this experience, I can say that railroad fueling and maintenance facilities throughout the industry serve the same basic function and are very similar in the aspects discussed in this report.

I am not being compensated by the Committee. I am receiving my normal salary which is paid by Union Pacific Railroad. Within the last four years, I have not testified or been deposed as an expert witness in any cases; I have been deposed as a fact witness in the following cases: Missouri Pacific RR v. Aetna Casualty Insurance Co., et al., Civil Action Number 93-V-1898-D, N.D. Texas, Dallas Division (1995); Missouri Pacific RR v. Reilly Industries, 93-CV-4307-JPG, S.D. Ill., Benton Div. (1994).

Documents and other sources of information reviewed and relied upon in preparation of this report are cited in the text of the report. To date, I have been provided with relatively little specific information regarding the fueling and maintenance facilities operated by Burlington Northern ("BN"). To the extent additional information becomes available, I may be able to expand or supplement the opinions which follow.

OPINIONS TO BE OFFERED AT TRIAL

The following summarizes the opinions I will offer at trial if called to testify in this matter:

Opinion 1: At railroad fueling and maintenance facilities, a number of CERCLA hazardous substances are generated, used, stored, handled, treated, or otherwise dealt with.

Basis for Opinion 1: As noted above, I have over 26 years of experience with Union Pacific and other railroads and have personally inspected more than 100 fueling and maintenance facilities for fuel spillage and waste disposal. Throughout the industry, railroad fueling and maintenance facilities serve the same basic function and are essentially similar. Based on my experience, I can state that at such facilities numerous CERCLA hazardous substances are generated, used, stored, handled, treated, or otherwise dealt with. For example, substantial quantities of used lubricating oil from locomotives, which contains various metals and other CERCLA hazardous substances, are generated, handled, and stored at such facilities. An oil change for a railroad locomotive generates approximately 400 gallons of used lubricating oil, and such oil changes are made at least once per quarter (4 times annually). Used greases and other lubricants which contain hazardous substances are generated and handled at such facilities. Various solvents/degreasers, such as stoddard solvent, which contain CERCLA hazardous substances after use, are used and handled at railroad fueling and maintenance facilities to clean engine parts and for similar purposes.

Opinion 2: The area where railroad fueling occurs is contaminated by spillage or dripping of used lubricating oil and used greases (CERCLA hazardous substances) which contaminates spilled diesel fuel which comes into contact with these substances.

Basis for Opinion 2: Given the physical environment in which a spill of diesel fuel occurs, whether from overfilling, leaking fittings, or other causes, the spilled diesel fuel which comes into contact with the ground or other surface underlying the fueling area will also come into contact and become contaminated with the used lubricating oil, used greases, and any other hazardous substances which have been dripped or spilled in the fueling area.

Based on my 26 years of experience working in the railroad industry, I can state with confidence that an area used for locomotive fueling will have, directly beneath where the locomotives are stopped for fueling, used lubricating oil and used greases that have dripped or spilled from the locomotives over the course of time. This happens because railroad locomotives, when idling in one place for a period of time, such as for fueling, will always drip at least a small amount of used oil and greases. There are only two locomotive manufacturers in the United States, and, in my experience, all locomotives drip in this way. While the drippage from a single locomotive is not

necessarily significant, the drippage from all the locomotives being fueled at a given fueling station will over time cause significant and visible staining and contamination of that area. I have personally observed this on many occasions. The attached photographs (Attachment 1) of UP's fueling facility at Council Bluffs, Iowa, illustrate this. Cleanups conducted at various UP facilities also confirm that such contamination of spilled diesel occurs. For example, I knew that various hazardous substances were found in the soil at a Union Pacific Railroad fueling and maintenance facility located at Parsons, Kansas, including used lubricating oil, used greases and lead, as well as spilled diesel. Similar contaminants, including lead, were found in soils during a remediation conducted at a UP fueling/maintenance facility located at Las Vegas, Nevada.

Opinion 3: The system used for collecting, treating, and storing spilled diesel fuel and other fluids at a railroad fueling and maintenance facility is one in which cross-contamination of the spilled diesel with used lubricating oil, used greases, used solvents, and other hazardous substances occurs.

Basis for Opinion 3: Again, based on my 26 years of experience in the railroad industry and my knowledge of railroad fueling and maintenance facilities, I have personal knowledge of how the waste oil/waste water collection and treatment systems are designed and operated at such facilities. Basically, all fluids which are spilled or otherwise deposited within the confines of the facility, including spilled or dripped diesel fuel, used lubricating oil, used solvents, corrosion inhibitors, cooling water, wash-down water, and precipitation, are collected in the industrial waste water sewer system and conveyed to the facility's waste water treatment plant. Then, the waste water that has been collected is processed through a treatment plant, such as an API separator or dissolved air flotation water treatment unit. The end result of the waste water treatment is two waste streams: a waste-oil stream and a waste-water stream. The waste-water stream is typically discharged into a POTW (Publicly Owned Treatment Works) or to surface waters, depending upon applicable regulatory requirements. After storage on-site for some period, the waste oil stream is typically sent off site for disposal, recycling, or some other final disposition. Testing of the waste oil stream from railroad fueling/ maintenance facilities reveals that, even when it consists predominantly of diesel fuel, it is also contaminated with used lubricating oil, BTEX (benzene, toluene, xylenes) and other hazardous substances indicative of cross-contamination. *See* waste oil test results (Attachment 2).

Drippage of degreaser/solvents used for parts cleaning purposes will be found wherever locomotives are repaired and maintained. Such spillage and drippage occurs routinely and by accident, even without any negligence or bad practices on the part of railroad employees. It is an inevitable byproduct of heavy industrial operations and large engine maintenance and repair. Used degreasers/solvents contain CERCLA hazardous substances, and (when spilled or dripped) make their way into the waste water collection and treatment system.

The waste water system I have just described has been in common use in the railroad industry since the 50's and 60's, and is now required by an array of federal and state environmental rules and regulations which govern the discharge of industrial process water, waste water and storm water. Based on the collection, treatment, and storage system described above, it is inevitable that spilled diesel fuel will come into contact with and become contaminated with used lubricating oil, used greases, used solvents/degreasers, and other hazardous substances in the course of being collected, treated, and stored on-site prior to being shipped elsewhere for ultimate disposal. I have reviewed certain plan views of BN facilities provided through discovery and (though the figures are not always completely clear and legible) it appears that at least some of the BN facilities (e.g. Pascoe and Glendale) use a single water treatment plant for the entire facility, which would result in the cross-contamination of spilled diesel with used lube oil and other contaminants in the way I just described. Once used lubricating oil (or other contaminants) and spilled diesel fuel come into contact with one another, it is virtually impossible to separate them. An API separator or similar treatment system would direct both substances into the waste oil stream, and would not separate out or remove the used lubricating oil (or other contaminants) from the spilled diesel fuel.

It is quite clear, from the available test results (Attachment 2) and from the practices of Union Pacific and every other railroad of which I have knowledge, that spilled diesel fuel is not pristine and uncontaminated, but instead fits within the general category of waste oil, which contains various contaminants resulting from the conditions at a railroad fueling and maintenance facility. It is clear that this is so, because if the spilled diesel fuel was uncontaminated, it would be put to the much more valuable use of a fuel in locomotives, something which to my knowledge is never done in the industry.

Opinion 4: To a reasonable degree of engineering certainty, I can state that the waste diesel oil conveyed to Mountain States Petroleum from BN fueling and maintenance facilities between 1978 and 1980 was contaminated with CERCLA hazardous substances.

Basis for Opinion 4: Based on my 26 years of experience in the railroad industry, as well as the information supplied to me regarding the types of facilities BN had, from which spilled diesel fuel was sent to Mountain States Petroleum and then to the Ekotek site, it is my opinion that the spilled diesel fuel generated at the BN facilities became contaminated with CERCLA hazardous substances. The fueling area upon which the spilled diesel fell would itself be contaminated with used lubricating oil and used greases, and the spilled diesel would pick up contamination in this area. CERCLA hazardous substances (used lube oil, used greases, used solvents) would have been spilled or dripped in the shop area where locomotives were repaired and maintained; liquids dripped or spilled in this area would be collected in the same industrial waste water system as the fueling area, adding additional contamination to the spilled diesel fuel. Finally, I know that such cross-contamination of spilled diesel fuel with various

hazardous substances occurs, based on test results of the "waste oil" stream which comes out of the waste water treatment system used at railroad fueling/maintenance facilities (*see* test results in Attachment 2). Based on all of this information, as well as my own experience, I conclude that, to a reasonable degree of engineering certainty, the waste diesel fuel conveyed to Mountain States Petroleum from BN refueling and maintenance facilities between 1978 and 1980 was contaminated with CERCLA hazardous substances. Additional support for my conclusion is found in certain test results provided by BN in discovery, in particular the 1982 and 1983 BN "test report work cards" (B23 to B26). These tests of BN's "waste oil" (also referred to as "spilled diesel fuel") from various locations show numerous "flash points" in the 180°-190°F range, and some even over 200°F. Another BN document, labeled "Appendix B" (B20) indicates that the flash point of "Fuel Oil for Diesel Locomotives" is 125°F. A third BN document (B21) indicates that the flash point of "Locomotive Diesel Engine Lubricating Oil" is considerably higher, 420°F. The elevated flash point of BN's "spilled diesel fuel," well above the flash point for BN's virgin diesel fuel, indicates that BN's spilled diesel has been mixed with spilled or waste lubricating oil, raising the flash point of the mixture as a whole.

Opinion 5: Diesel fuel, once spilled and contaminated with water and/or soil, is not longer fit to be used as fuel in railroad locomotives.

Basis for Opinion 5: Once diesel fuel is spilled, it picks up dirt, sediment and water, at a minimum. As a result, such spilled diesel fuel cannot then be used as a fuel in railroad locomotives, because of the risk of clogging, plugging or other engine malfunction. In the industry, spilled diesel is not considered a useful product or one that any company deliberately produces but rather is considered a waste material, one that needs to be managed and dealt with as cost-effectively as possible. From January through September of 1980, the average price UP paid for new train diesel fuel was $.8096 per gallon, which I am confident was essentially the same price paid by other railroads in that time frame. This is considerably more than the $.10-$.30 per gallon that BN received for its spilled diesel fuel in this time-frame, which illustrates the basic difference between these two materials.

EnviroSearch

Dennis Downs
Director, Bureau of Solid & Hazardous Waste
P.O. Box 16690
Salt Lake City, Utah 84116-0690

RECEIVED
JUL 12
Utah Dept. of Health
Bureau of Solid & Hazardous Waste

July 10, 1990

Dear Dennis,

I was interested in comments at the last Hazardous Waste Committee Meeting regarding the Rose Park Canals. It seems that interest still exists and I would like to offer my help.

You may remember that these canals were "discovered" by me during my tenure as a regulator. I had been spending a great deal of time working on the Rose Park Sludge Pit and had consistently heard from nearby residents rumors of black sludge surfacing in yards and crawlspaces. I became intrigued by these persistent rumors and began investigating this on a fairly full time basis for months. I spoke with many people, some of whom are now dead such as ex-fire chiefs who responded to fires in the canals, and uncovered much obscure, pertinent information that is possibly still available, albeit in unexpected places.

Brad Johnson seemed to indicate that the locations of the canals are still in question. I can steer you to maps that virtually indicate the locations of these. As I see it, EnviroSearch has absolutely no conflict of interest, or in fact, no interest at all from a business standpoint in the Rose Park Canals. I am however, willing to offer my assistance and knowledge of this situation (at no charge, of course) should you and/or Brad think this may be of value. At one time, I knew more about these canals than anyone else and this may still be the case. I am just interested in helping as a citizen if I can.

I have never been satisfied that these canals were fully investigated, however, I am not suggesting that they are a problem. They may or may not be. I also sent out a questionnaire to the neighborhood, the results of which I have a copy of. I would hate to see resources spent re-doing some of the work I did that may be applicable.

Please let me know if I can be of help.

Very truly yours,

Dave

David Nelson
President

DN/tlc

cc: Brad Johnson

Corporate Office
608 East Wilmington Avenue
Salt Lake City,
Utah 84106 USA
(801) 466-1035
Fax (801) 466-1038

Affiliates Worldwide

EnviroSearch-East
2400 Virginia Avenue N.W.
Suite C 103
Washington, D.C. 20037
(202) 775-1139
Fax (202) 775-0928

2.04N 168N 1950W, EPA Joyce Akerman meeting 7/7/97 10AM

Diesel & Gas found in triangle area.
1500-2,000 Gallons recovered. March 1997 spill.
U Pacific Ogden yard #1 EPA site. Bury sludge from roundhouses
Leaks in yards for years. COCO

Northwest oil drain listed on NPL.

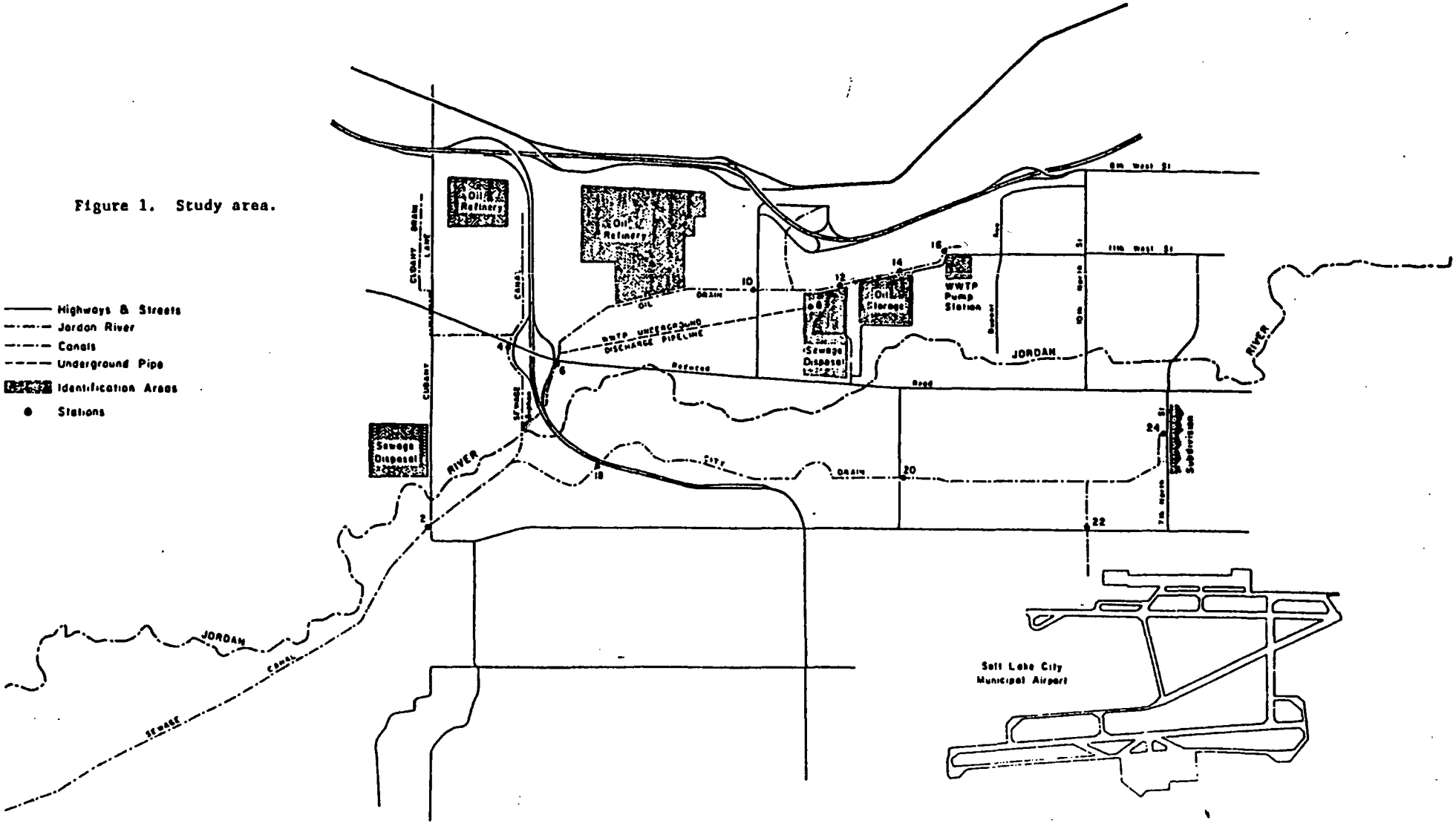
Abandoned sewer line? exfiltration is it really plugged.

Data & actions from Amoco & UP.

UP regained ~~annual~~ annual or semi annual monitoring

24 HR # 536-4123 STATE EMERGENCY #
~~State~~

Figure 1. Study area.



LIBRARY

PLEASE

WATER QUALITY IN THE SEWAGE CANAL

MAY 1976

RETURN

S.L. COUNTY ENGINEERING DIVISION
2001 S STATE STREET, #N3300
SALT LAKE CITY, UTAH 84190-4600
(801) 468-2711

TERRY WAY

SALT LAKE COUNTY
208 WATER QUALITY
PROJECT

EPA POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE 02 SITE NO.
UTD980667000

II. SITE NAME AND LOCATION

01 SITE NAME (Logo, common or descriptive name of site)
Rose Park Canals

02 STREET, ROUTE NO. OR SPECIFICATION LOCATION IDENTIFIER 03 CITY
Vicinity of Ninth North Street, West of Seventh West Street Salt Lake City

04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST.
Utah	84116	Salt Lake	035	02

09 COORDINATES LATITUDE 40 49 00._ LONGITUDE 111 53 30._

10 DIRECTIONS TO SITE (Starting from nearest public road)
Exit I-15 at 600 North Street exit. Proceed west to Eleventh West Street and turn north. Eleventh North Street becomes Boy Scout Drive at Tenth North.

III. RESPONSIBLE PARTIES

01 OWNER (if known) 02 STREET (Business, mailing, residential)
Salt Lake City Corporation 72 East 400 South

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Salt Lake City	Utah	84111	801-535-6131

07 OPERATOR (if known and different from owner)
See above.

08 STREET (Business, mailing, residential) 09 CITY 10 STATE

11 ZIP CODE 12 TELEPHONE NUMBER

13 TYPE OF OWNERSHIP (Check one)
A. PRIVATE B. FEDERAL:_____ C. STATE
D. COUNTY X E. MUNICIPAL F. OTHER:_____ (Specify) G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
A. RCRA 3001 DATE RECEIVED ___/___/___
B. UNCONTROLLED WASTE SITE (CERCLA 103c) DATE RECEIVED ___/___/___
X C. NONE

IV CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION BY (Check all that apply)
X YES DATE 03/27/87
NO
A. EPA B. EPA CONTRACTOR
X C. STATE D. OTHER CONTRACTOR
E. LOCAL HEALTH OFFICIAL
F. OTHER:_____ (Specify)

CONTRACTOR NAME(S):

02 SITE STATUS (check one)
A. ACTIVE X B. INACTIVE C. UNKNOWN

03 YEARS OF OPERATION prior 1926 (BEGINNING YEAR) 1952 (ENDING YEAR) UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT KNOWN OR ALLEGED
Oil refinery wastes, railroad maintenance shop wastes, and unknown liquid industrial wastes were discharged to the Rose Park Canals. After many years of operation, the canals were buried. Sludges were left in place and may contain any number of contaminants, including benzene, phenanthrene, and ethylpthalate.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
There appears to be no migration of contaminants from the site. Organic contaminants present in sludges buried in the canals could, however, potentially contaminate air or groundwater..

V PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one, if high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

A. HIGH (inspection required promptly)
B. MEDIUM (inspection required)
X C. LOW (inspect on time available basis)
D. NONE (No further action needed, complete current disposition form)

VI INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency, Organization)	03 TELEPHONE NUMBER
Joel Hebdon	Utah Dept. of Health, BSHW	801-538-6170

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.
Joel Hebdon	Health	BSHW	801-538-6170

08 DATE
April 2, 1987

EPA FORM 2070-12(7-81)

Amoco Oil Company
200 East Randolph Drive
Post Office Box 6110-A
Chicago, Illinois 60680

June 2, 1982

Ms. Margot Nielson
USEPA, Region VIII
1860 Lincoln Street
Denver, Colorado 80203

Dear Margot:

Analyses of Rose Park Sludge and Oil Samples

Attached are tables giving results of analyses on samples of oil and sludge from in and around the former dump site in Rose Park. The two sludge samples were collected last August, and the oil samples were collected from borings into the old drainage canal during the work conducted by Golder Associates in the spring of this year.

Results of analyses for metals are listed in the first table. We intended, by these tests, to show that the material in the old canal was different from the material in the sludge pit, and that it was probably diesel lube draining from railroad shops in the area. The data leave little doubt that all three materials are different, but they are not as conclusive as we had hoped in identifying the oil from the canal. However, some of the data suggest the oil in the canal could have originated in the railroad shops. During the period that the canal was an actual surface drain, diesel lubricating oil additives contained barium, phosphorus, and sulfur. The oil sample from the canal contains all three of these elements. Concentrations of barium and phosphorus are significantly larger than in the sludge pit samples. Sulfur in the sludge pit samples ranged from about 25 per cent to nearly 150 per cent greater than sulfur in the canal oil. High sulfur would be expected in the sludge pit material since it is believed to be largely residue from the sulfuric acid treatment of light petroleum products.

One other metal in the canal oil that may be significant is lead at 360 ppm. Railroad journal-bearing lubricants are rich in lead salts, so the presence of lead in the oil further suggests a railroad operation as the source.

The second table shows volume per cent saturates, aromatics, and polar compounds in the canal oil samples, along with simulated distillation data. The composition data are not conclusive, but they are not inconsistent with diesel lube oil. Until recently, diesel lube base stocks were not treated for removal of aromatics. Similar data are not available for the sludge samples.

Simulated distillations showed that all samples have portions boiling in the lubricating oil-gas oil range. Using the indicated arbitrary boiling-range criteria, following are estimated compositions of the samples in terms of various petroleum fractions:

	Volume %			
Sample	Naphtha (<300°F)	Heating Oil (300-500°F)	Lube Oil-Gas Oil (500-1000°F)	Resid (1000+°F)
B-11A	5	15	45-50	30-35
Canal, near rest room	0	11	82	7
Canal, P-13	0	11	65	24
Canal, P-6	0	0	77.5	22.5
Canal, P-3	0	9	70	21

Diesel lube stocks actually contain a significant portion boiling above 1000°F. These stocks are principally SAE 40 and SAE 50 which, as Appendix A shows, contain on the order of 15-25 per cent hydrocarbons having 44 or more carbon atoms, and which boil in the 1000+°F range.

We hope these data are satisfactory. Please call me at 312/856-5858 if you wish to discuss.

Yours truly,

E. J. Sullivan
Mail Code 1203

EJS/omj

Attachments

R. F. Babcock
H. M. Brennan
G. H. Watson
Rose Park File

Metals Contents Rose Park Samples, ppm (except S)

	(April, 1981) Oil From Canal	Sludge Pit Oil Fraction B-11A(1)	Sludge Pit Oil Fraction SP-3(1)
Al	170	60	60
Sb	2.7	9.8	3.6
Ba	20	10.3	3
B	4.5	23.9	29
Ca	1180	1410	720
Cr	4.7	25	4.8
Cu	13	5.3	9.6
Fe	320	168	472
Pb	360	26	158
Mg	154	1080	223
Mn	5	2.7	2.3
Mo	< 0.6	< 1.3	< 0.9
Ni	14	5.2	2.9
P	110	< 61	66
Se	-	< 4	< 3
Si	300	32	36
Ag	< 0.2	< 0.5	< 0.4
Na	71	429	312
S	2%	4.7%	2.5%
Sn	< 3	< 6.3	< 4.6
V	35	1	3.8
Zn	16	< 0.3	2.9

(1) Sampled in August, 1981.

EJS/lar
5/26/82

Oil Samples from Old Canal in Rose Park

Test	Sample Identification			
	Near Rest Room	P-13	P-6	P-3
Saturates, Vol.%	41	50	43	51
Aromatics, Vol.%	33	45	46	41
Polar CMPDS, Vol. %	26	5	11	8
Simulated Distillation, °F:				
Initial	405	367	505	349
10%	494	488	571	507
50%	647	777	790	716
70%	769	927	913	874
% @ 1000°F	93%	76%	77.5%	79%

EJS/lar
5/26/82

B. Other (SX and HF) American Oil Base Stocks

Liquid Volume Percent

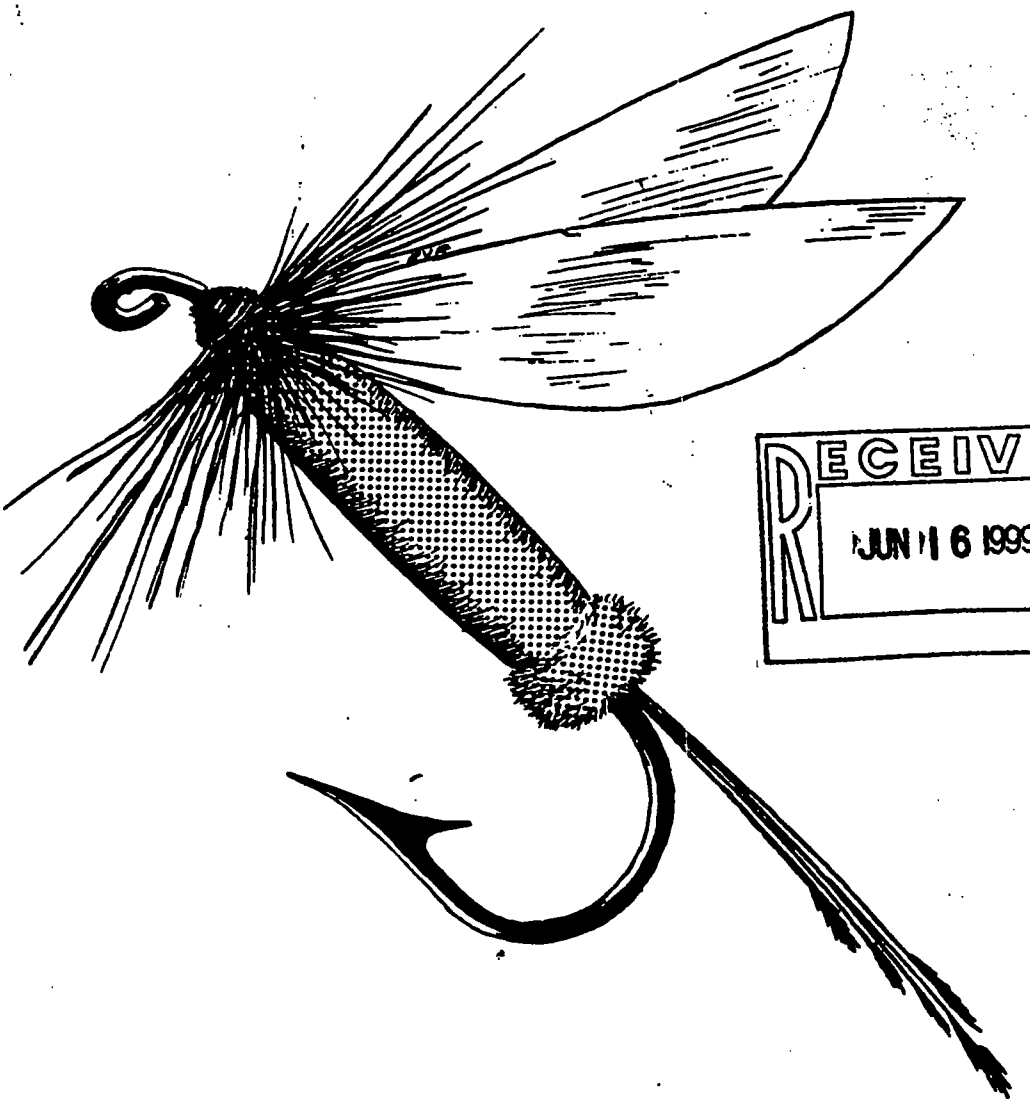
	Casper SX							Whiting SX						Whiting HF								
C	65N	200N	5	10	20	40	50	5	5	10	10	20	20	56	56	80		210			535	
	2-67	2-67	2-67	2-67	2-67	2-67	2-67	11-66	4-67	11-66	2-67	11-66	4-67	8-66	11-66	8-66	11-66	8-66	11-66	4-67	8-66	11-66
12														1.3	1.1		0.7		0.5			
13														1.4	1.5		0.8		0.6			
14														1.6	1.9		1.0		0.7	0.1		
15														1.9	2.3	0.8	1.1	0.2	0.7	0.5		
16	1.0							0.3	0.5					3.4	3.6	2.2	2.3	0.6	1.0	0.8		
17	2.4							0.9	1.3	0.1	0.1			5.8	5.3	4.0	4.0	1.4	1.5	1.4		
18	4.0							1.6	2.1	0.4	0.3			7.6	7.2	6.2	5.8	2.3	2.1	2.1		
19	6.0							2.8	3.4	0.5	0.6			9.2	9.6	7.4	7.2	1.0	2.9	2.5		
20	8.4							4.3	5.0	0.7	1.0			11.1	10.4	9.0	8.8	1.9	3.6	3.6	0.6	0.2
21	12.1		1.4					5.4	6.3	3.1	1.2			12.6	11.7	9.5	9.4	6.6	3.8	4.2	1.5	1.5
22	13.3	1.8	5.2	0.6	0.2			6.8	7.3	2.4	2.4	0.4	0.2	11.3	10.1	9.7	9.3	4.3	5.0	4.9	2.4	2.6
23	14.7	3.6	9.9	1.6	0.2	0.2	0.2	7.7	8.0	3.5	3.4	0.6	0.4	9.4	8.2	9.3	8.5	5.9	5.8	5.2	3.0	3.1
24	12.7	6.3	15.0	3.3	1.3	0.5	0.7	8.1	8.5	5.4	4.8	1.2	1.0	8.0	7.0	9.0	8.1	6.5	6.3	6.7	3.7	4.6
25	9.5	8.1	16.7	4.0	1.5	0.0	0.0	8.3	8.2	5.7	6.2	1.5	1.6	5.1	5.1	7.3	6.6	7.6	6.7	6.9	4.2	5.5
26	9.7	8.0	13.7	5.9	1.3	0.5	0.4	7.7	7.0	3.9	6.4	2.0	2.1	3.8	4.7	5.6	5.9	6.1	6.5	6.7	4.7	1.7
27	4.7	13.2	18.0	18.2	4.4	0.0	0.1	8.7	9.1	9.2	9.0	2.5	3.6	3.7	3.9	5.5	5.8	8.0	8.0	7.9	6.6	5.5
28	2.6	14.7	10.9	21.8	7.9	2.7	1.6	8.1	7.6	9.6	9.1	4.4	6.0	3.0	3.4	4.5	4.1	7.4	7.0	7.3	6.0	5.4
29		14.5	5.7	18.5	10.2	2.9	2.1	7.1	6.9	12.2	11.5	6.9	6.4		3.6	4.4	4.8	8.4	9.1	8.6	7.6	8.5
30		14.1	3.6	14.0	13.2	3.3	3.6	6.3	5.5	10.5	12.4	7.4	7.5			2.4	1.6	7.2	6.9	7.2	7.7	7.4
31		6.3		6.9	10.5	5.0	2.9	4.7	3.5	8.6	7.4	7.1	8.2			1.4	2.2	5.1	5.0	6.2	7.2	7.0
32		4.0		3.5	9.3	4.3	3.8	3.3	3.7	6.4	7.1	8.2	8.6			1.9		4.3	4.7	3.8	6.3	5.9
33		2.4		1.7	8.2	5.6	4.0	2.3	2.4	4.9	5.4	8.3	6.6					3.6	3.8	3.4	6.4	9.1
34		1.8			8.2	6.8	4.4	1.9	2.4	4.4	4.3	8.2	5.6					2.5	2.4	3.2	5.6	6.0
35		1.2			6.6	7.9	5.0	2.1	1.5	3.2	2.8	7.5	7.1					1.8	2.3	2.9	5.7	5.1
36					4.8	7.8	5.4	1.6		2.3	2.2	7.7	7.2					1.4	1.3	2.4	5.5	5.1
37					3.9	7.9	7.1			1.9	1.5	6.5	6.3					1.8	1.8	1.8	1.1	5.2
38					3.0	7.6	6.7			1.2	1.1	5.5	5.7								3.4	1.2
39					2.1	9.1	6.3					4.3	4.2								2.7	2.9
40					1.8	5.9	6.6					1.9	2.1								2.2	1.1
41					1.5	2.5	5.6					2.5	3.3								1.5	1.5
42						2.6	5.0					1.1	2.4								0.7	2.0
43						3.8	5.4					1.4	1.8								2.4	
44						1.9	4.1					0.9	1.0									
45						3.1	1.4						1.2									
46						2.5	1.6															
47						1.4	1.5															
48						0.8	2.5															
49						0.6	2.9															
50						0.7	2.1															
51						0.4	1.8															
52						0.2	1.6															
53						1.0	1.7															
54						0.8	1.1															
Av. MW	306	382	351	387	435	504	525	349	342	389	390	454	455	279	281	306	300	353	347	357	416	417
95%	27	33	29	32	39	47	51	34	33	36	35	41	42	27	28	30	30	35	35	35	40	39
5%	18	23	22	24	27	29	29	19	19	22	22	26	26	15	15	17	16	19	17	19	23	23
Span	9	10	7	8	12	18	22	15	14	14	13	15	16	12	13	13	14	16	18	16	17	16

NWOD
Doc #21 - Amoco - 1041(e) response

1958

GENERAL SURVEY OF WATER POLLUTION IN UTAH

DEPARTMENTAL INFORMATION BULLETIN 61-9



UTAH STATE DEPARTMENT OF FISH & GAME
Harold S. Crane, Director

TITLE OF JOB

General Survey of Water Pollution in Utah.

OBJECTIVE

To locate and determine the extent and nature of water pollution existing in Utah from June 1, to October 1, 1958.

PROCEDURE

The State was divided into the following major water drainages:

I	Colorado and San Juan Rivers
II	Green River with White River, Duchesne River and Price River as major tributaries
III	Bear River with Malad, Logan and Little Bear River as major tributaries
IV	Weber River with Ogden River as major tributary
V	Utah Lake, Great Salt Lake and Jordan River with Provo River and Spanish Fork River as major tributaries
VI	Sevier River
VII	Virgin River

Each major drainage was investigated thoroughly to determine the source, nature and extent of pollution existing.

Chemical analyses of water samples were made to determine exact nature of pollutant being liberated.

Tests were made to determine tolerance of fish to the known and unknown pollutants.

Photographs in color and black and white were made of areas where pollution was most serious.

FINDINGS

Virtually all the waters of Utah were found to contain either industrial or domestic pollution or both in varying degrees of intensity.

This report will discuss each drainage system, as above outlined, on the basis of (A) domestic pollution and (B) industrial pollution. Pollution will be regarded as the addition or introduction of any substance to the water that may render such water less desirable or unsuited for acquatic life.

I COLORADO AND SAN JUAN RIVERS

DOMESTIC POLLUTION

The Colorado River has its source in neighboring states and only relatively

60° F it became soft and very sticky clinging to the mud and vegetation. During most of the daylight hours the pitch was in this soft state and when birds, large or small, came in contact with it they were immediately trapped to remain there and die of starvation and exhaustion (See Photographs 41,44, and 45).

When the seriousness of the situation was observed by the Utah Power and Light Company they immediately ordered men and equipment to the disaster area and proceeded to remove the pitch to a safe burning and burial area. Due to the nature of the pitch and the fact that it had separated into small pieces and had spread over a large area, the clean up job became very costly and time consuming. Large quantities of pitch were removed by draglines, however, much of it had to be picked up and carried away by hand. Company officials estimate the cost of the accident at some $90,000.00.

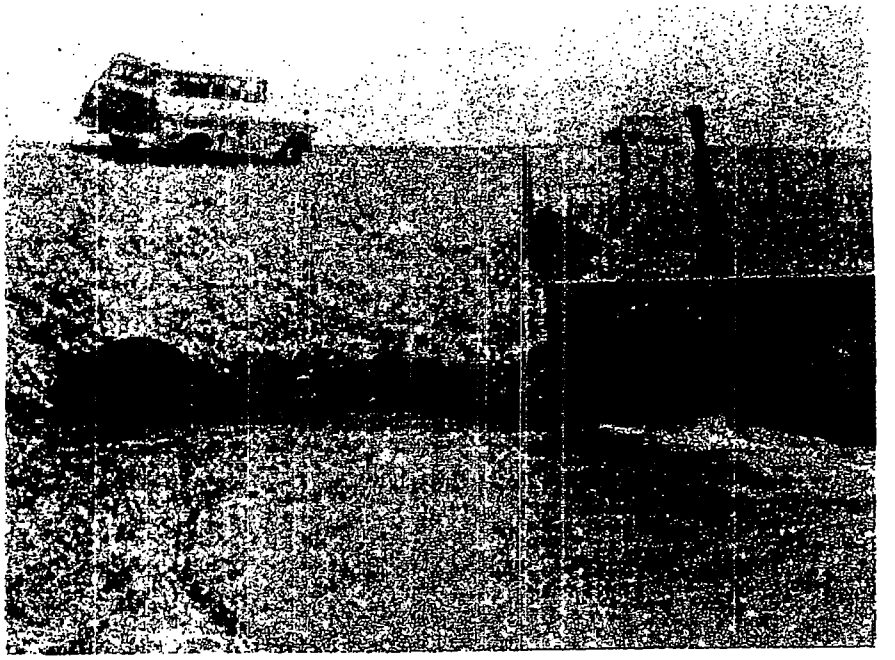
While considerable numbers of birds were lost and much disturbance on the nesting areas created by the clean-up activities, much more damage could have resulted had the company refused to assume their responsibility and withheld their excellent cooperation in the clean-up job. Further details of the accident are in other reports on file in the Utah Fish and Game Office in Salt Lake City.

Sugar factories, smelters, food processing plants, and other milling operations located along the course of the Jordan all contribute waste materials to the river. The sugar factory at West Jordan is a major source of organic waste materials entering the stream. Factory wash water and pulp waters are drained directly into the Jordan, as are the wastes from the large smelting and milling plants located at Midvale and Murray.

Disregard for the proper disposal of industrial waste has reduced the Jordan River to a foul, unpleasant stream throughout its entire length.

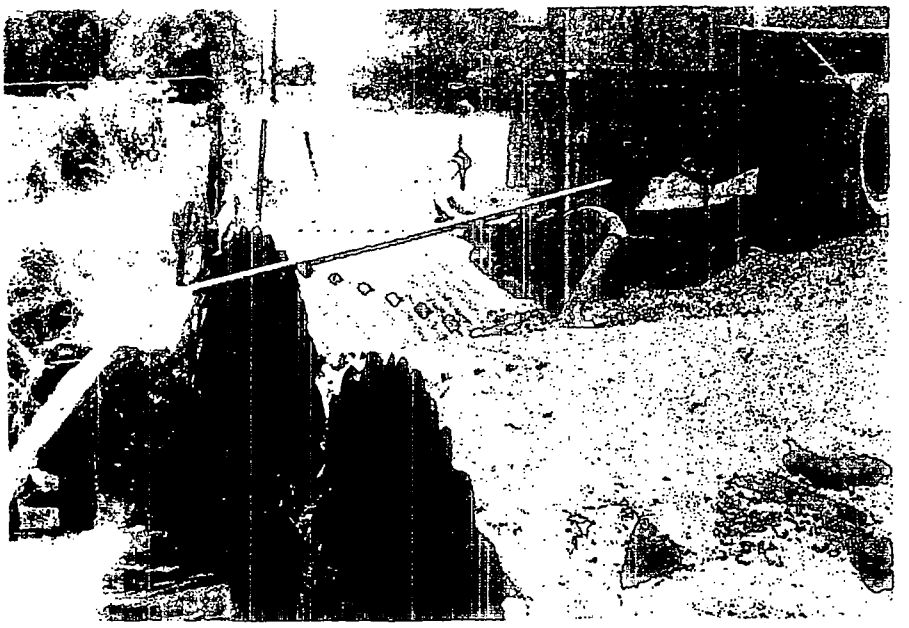
The Utah State Department of Health, the University of Utah, and the Utah Water Pollution Control Board have all made investigations on the pollution of the Jordan River and have all concluded that the stream is highly charged with pollutants of numerous types. From a recreational point of view it is very disheartening and disturbing to think of a river, flowing through a heavily populated area, that could be used for boating, swimming, and angling rendered useless by uncontrolled domestic and industrial pollution.

Great Salt Lake is the recipient of all residual waste from Utah Valley and Salt Lake Valley via the Jordan River. In addition to the Jordan wastes, Great Salt Lake receives considerable industrial wastes through the Salt Lake City sewer canal. The Utah Oil company, Union Pacific Railroad Company, Cudahy Packing Company, Standard Oil Company, and Western Oil Refining all discharge wastes into the Salt Lake City sewer canal which flows direct to Great Salt Lake (See Photographs 21, 26A, 31,32,39 and 40). It is obvious that a canal flowing some 30,000,000 gallons of raw sewage plus large quantities of industrial oil wastes into a lake every day, can



Photograph 26.

Outlets of Salt Lake City sewer line (right) and industrial sewer line (left) at 17th West and 25th North. Salt Lake City releases 30,000,000 gallons of raw sewage per day while the industrial sewer releases less but more potent wastes into this sewer canal to be run off into the duck marshes on the shores of Great Salt Lake (see photographs 21 and 26A.)

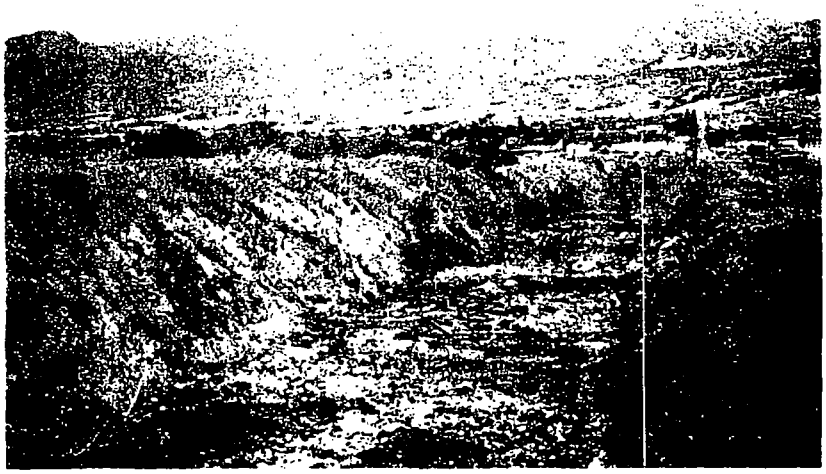


Photograph 26A.

Truck leased by Utah Oil Company dumping waste sulphuric acid and caustic soda into sewer canal at 35th North. This company disposes of some fifteen, twenty-three gallon loads of these materials each week to flow into Great Salt Lake and adjacent marshes.

Photograph 31.

General view of industrial sewage canal coming from Utah Oil Refinery Company and the Union Pacific Railroad yards in North Salt Lake. Houses in the background are a portion of Rose Park residential area. The area is unsightly and a hazard to the children of the neighborhood. This contamination flows some two miles before it enters Salt Lake City's open sewer to Great Salt Lake.

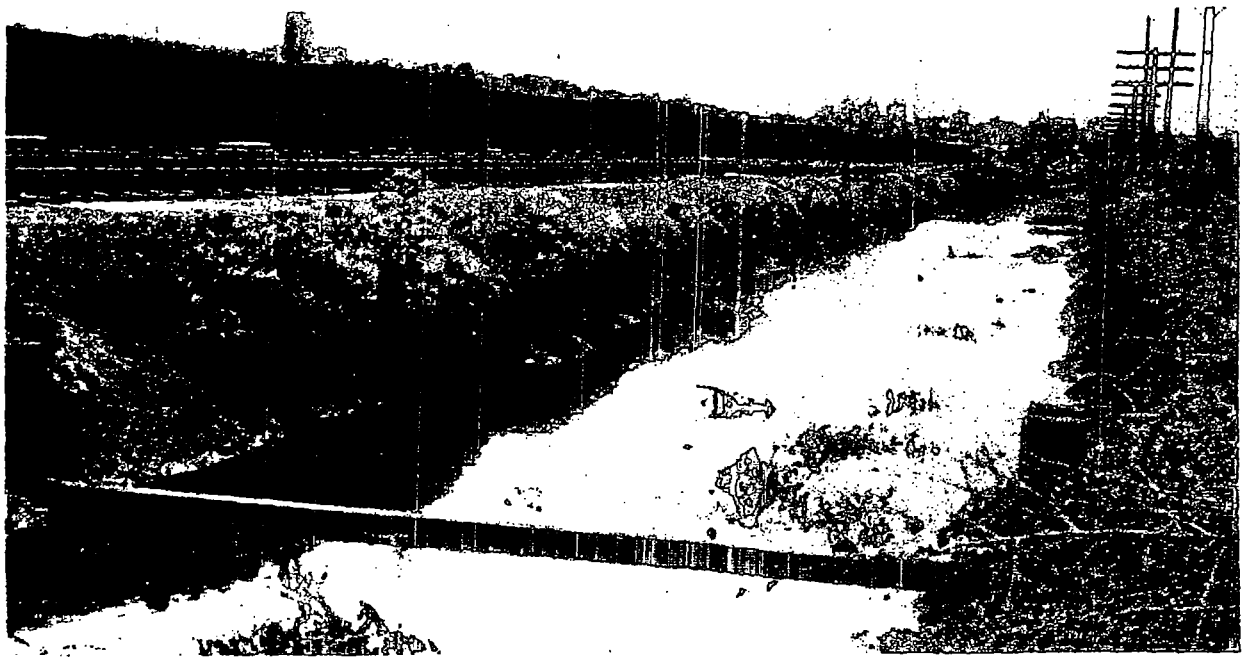


Photograph 32. Waste ditch from Cudahy Packing Plant in North Salt Lake.

This ditch carries large quantities of blood, paunch washings and scraps from cookers and escaped animal fats. The materials enter the ditch and because of shortage of water remain there to rot. This condition is unsightly and is causing very bad odors to develop. The stream parallels Cudahy lane, a main highway of the district, and flows very slowly to Salt Lake City sewer canal where it is there carried to the duck marshes and Great Salt Lake. Aside from being a very obnoxious situation it is a definite health hazard.

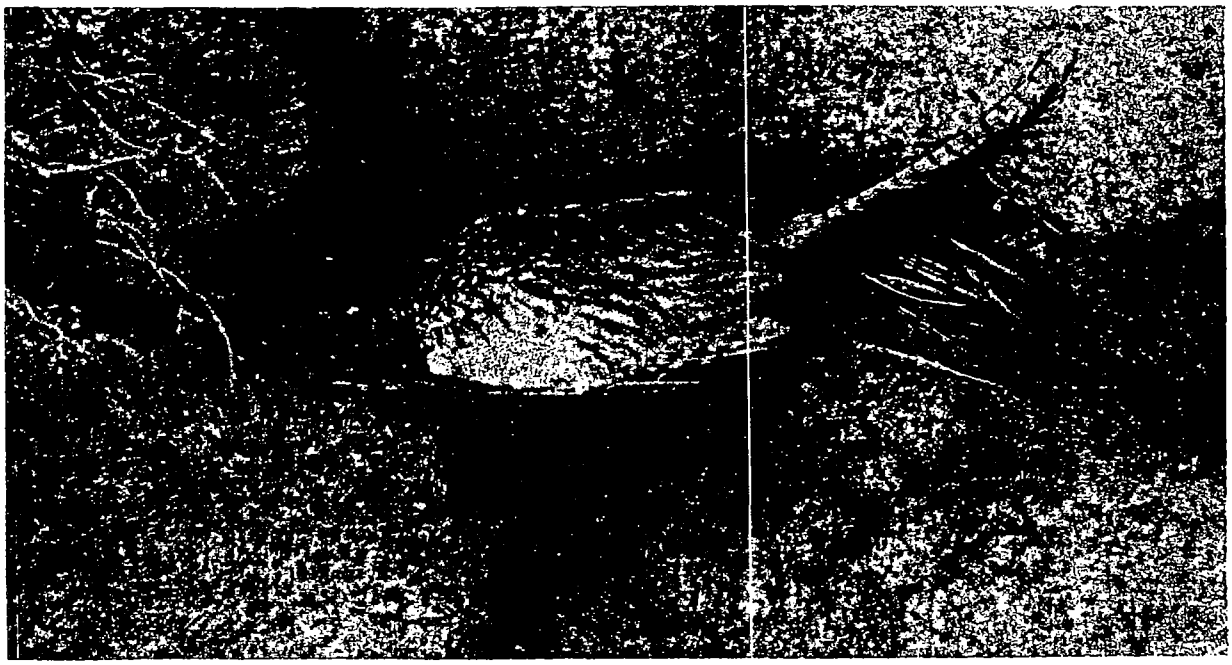
Photograph 39. Waste ditch from Union Pacific Railroad repair shop.

This stream originates at Wasatch Spring Baths resort and flows to the Salt Lake City sewer canal. As the stream passes the Union Pacific Railroad yards many gallons of oil and washing compound from the railroad shops are released directly into it. Oil skimmers are placed along its course but are ineffective. Note oil marks along banks. Burning cannot be done safely because of the proximity of power lines and railroad tracks. Oils from this source flow on to duck marshes along the shores of Great Salt Lake.



Photograph 40.

Photograph shows condition of waste ditch coming from Union Pacific Railroad yards. The plank in foreground is intended to skim oil from water to be burned; however, because of proximity of tracks and utility poles this is not possible. Oils should be removed from shop wastes within the shop and never be permitted to reach any stream. Present waste water and oil flow through sewer ditch to marshes in Great Salt Lake.



Photograph 41.

Adult male pheasant trapped in waste tar near Gibbons and Reed mix plant at 9th North and 8th West. Traps like this cause the death of many small animals as well as birds. Wastes of this nature should be buried.

Photograph 42. Columbia Steel Company silt trap.

Immediately below the Columbia Steel Company plant the waste waters from the plant enter a series of silt traps. Some of the plant wastes are removed here, however, none of the toxic chemicals are affected. A new series of settling ponds have been constructed to the right of this area to remove more of the solids from the waste stream. Because of the dissolved chemicals that cannot be settled out the stream still constitutes a very serious pollution source for Utah Lake.

August 14, 1952

Mr. A. D. Hansen, General Manager
South - Central District
Union Pacific Railroad Company
10 South Main Street
City

Dear Sir:

With reference to our recent meeting in your office and previous correspondence relative to the proposition of piping waste water drainage now flowing in open ditches in the vicinity of Ninth to Thirteenth North Streets, west of Seventh West Street in Salt Lake City, Utah.

We did appreciate the opportunity of meeting you and discussing our problem with you and members of your staff regarding this bad situation which we all feel should be abated.

In reviewing the situation further and as discussed with you, and knowing that the work proposed will necessitate the expenditure of a large sum of money, the City has made every effort to cut the cost of this project every way possible. The Utah Oil Refining Company has agreed to paricipate in this work to the amount set up in the estimate submitted providing the City would stand the cost of engineering and would eliminate the cost of connecting drain line at approximately Eleventh North Street; this item was shown on the estimate as 520 feet of 24-inch reinforced concrete pipe.

In order to get this work done now the City has agreed to absorb the engineering fee amounting to $7307.60 and to eliminate that portion of the work on Eleventh North Street at this time, amounting to $2459.60, total amount deducted from the original submitted estimate to be $10,267.20. Figuring on the same proportional cost as estimated the Utah Oil Company's cost amounts to $11,790.15; the Union Pacific Company's cost would be $18,865.08; the City of Salt Lake cost would be $29,132.27. Total cost is estimated at $69,787.50.

Mr. A. D. Hansen, General Manager August 14, 1952

We feel, as expressed at the meeting, that due to the fact that the Railroad Company has previously contributed to this nuisance, and still is a contributor, that this responsibility should be considered, however, the fact that upon completion of your new layout for diesel service your contribution will be cut considerably, and based upon these facts the proportional costs are fair and equitable, considering other phases that were discussed and which should be taken into account.

It is imperative that the work of this project get under way, and arrangements are being made to advertise the work and get construction started as soon as possible, so we would appreciate favorable assurance from you that you will participate proportionately in this much needed improvement.

Again thanking you for your consideration in this matter, I am

Very truly yours,

LWM:fc
cc: Comm. J.L.Christensen

Roy W. McLeese
City Engineer

August 8, 1952

Hon. Joe L. Christensen
Commissioner of Streets
and Public Improvements
City

Dear Sir:

Ref. #870

With reference to proposition of eliminating the nuisance of open oil drainage ditch located just North of Ninth North Street, West of Seventh West Street, by placing pipe line to carry this waste and which project cost is to be participated in by the Utah Oil Refining Company, Union Pacific Railroad Company and the City of Salt Lake.

The Utah Oil Refining Company have submitted a proposal to the City in their letter to me dated February 18, 1952, copy of which is attached hereto, in which they agree to contribute an amount of $35,000.00 as their share of this project, subject to the terms explained in their above letter.

In view of the urgency and necessity of abating this nuisance it is my recommendation that the offer made by the said Utah Oil Refining Company be accepted, that the City Attorney be authorized to draft an agreement between the City and the said Utah Oil Refining Company, under the terms as set forth in their letter, and that the City Engineer be authorized to proceed with this project, which should be accomplished soon.

We met recently with the Union Pacific Railroad Company management and they tentatively agreed to participate in this undertaking. Money has been appropriated for the City's portion of this project.

Respectfully yours,

LM":fc
encl.
cc: E. Ray Christensen

Roy W. McLeese
City Engineer

470

FORM 2104

UNION PACIFIC RAILROAD COMPANY

DEPARTMENT OF OPERATION
SOUTH-CENTRAL DISTRICT

9193-C-G

A. D. HANSON,
GENERAL MANAGER

10 SOUTH MAIN STREET
SALT LAKE CITY 1, UTAH

April 4, 1952

Mr. Roy W. McLeese,
City Engineer, Salt Lake City Corporation,
Salt Lake City, Utah

Dear Sir:

Referring to your letter March 11, with reference to the proposition of piping waste water drainage now flowing in open ditches in the vicinity of 9th to 13th North Streets, west of 7th West Street, Salt Lake City.

As you undoubtedly know, since our last meeting in Commissioner Christensen's office it has been decided that we will construct a modern Diesel servicing plant replacing our existing roundhouse and other mechanical facilities at Salt Lake City. We are just getting this work under way and since starting construction we have discontinued servicing a large number of steam engines due to the fact our roundhouse facilities are being removed. Servicing of this steam power and other mechanical work is now being handled at Provo, Ogden and Pocatello.

By discontinuing the servicing of steam power at Salt Lake City we have eliminated practically all of the oil that was previously being conveyed through our various drain lines to the ditches west of our yard area. At the present time there is very little oil, or other contaminating substances being conveyed through these pipe lines.

It is our intention to construct a Gale oil separator in connection with our new Diesel repair shop which when installed will eliminate any waste oil whatever getting into the ditches.

A recent survey also indicates that of the water entering into the ditches from drain lines under our yard 75% of same originates from springs or natural drains from streets and other properties located east of our yard, and is merely conveyed across

+7.

our yard area and empties into ditches on the west side.

These several items has altered our status considerably as to the amount of contaminated substances we will be emptying into these ditches in the future, in view of which we prefer to withhold any commitment on participating financially in this venture of constructing pipe line for the present.

Yours very truly,

A. D. Hanson

Copy sent to Comm. Christensen
See letter of 4/8/52

March 11, 1952.

Mr. A. D. [illegible], District Manager
Union Pacific Railroad Company
U. P. Building, No. 10 South Main Street
C i t y

Dear Sir:

With reference to [illegible] letter of January 3rd, [illegible] and our subsequent meeting held in the office of Street Commissioner Joe L. Christensen, relative to the proposition of piping the waste water drainage now flowing in open ditches in vicinity of Ninth to Thirteenth North Streets, west of Seventh West Street in Salt Lake City. Our File [illegible].

Mr. Sid Burridge from your office, together with Mr. Corey of your Legal staff, representatives of the Utah Oil Refining Company and the City, were in attendance at the above meeting to discuss this serious problem confronting Salt Lake City in the matter of eliminating an existing nuisance created by the type of waste now flowing in this open ditch and which waste originates from the Oil Refinery and the U.P.R.R. Co. shops area. This created nuisance and accompanying odors are the source of many complaints from property owners in the area and we feel that something must be done soon.

A tentative plan was developed at the above meeting and we were to receive information from the Union Pacific Railroad Company and others concerned as to their agreement and willingness to cooperate, but to date we have received no information from your Company as to what they will do regarding this matter, and in view of the fact that some decision must soon be made will you please advise as to your willingness to do your part in eliminating these troubles. Thanking you, I am

Very truly yours

[illegible]/ld

Copy to Comm. Joe L. Christensen

Roy W. McLeese
City Engineer.

FORM 2134

UNION PACIFIC RAILROAD COMPANY

DEPARTMENT OF OPERATION
SOUTH-CENTRAL DISTRICT

F. C. PAULSEN,
GENERAL MANAGER

M. O. WILLARD,
ASSISTANT TO GENERAL MANAGER

10 SOUTH MAIN STREET
SALT LAKE CITY 1, UTAH

September 24, 1951

9193-3-G

Mr. Roy W. McLeese, City Engineer
Engineering Department
City and County Building
Salt Lake City 1, Utah

(CC- Mr. Joe L. Christensen, Commissioner
Streets and Public Improvements
100 City and County Building
Salt Lake City 1, Utah

Mr. F. R. Clark, Vice President
Utah Oil Refining Company
Utah Oil Building
Salt Lake City, Utah)

Dear Mr. McLeese:

Reference is made to your letter of August 14, relative to proposed sewer drainage pipe extending from 9th North to 13th North, west of 7th West Street, Salt Lake City.

As you know, in the past we have always endeavored to cooperate with the City on various projects in which we were in any way involved. We are desirous of maintaining such a relationship with the City now. But after a thorough analysis of the proposal which you have submitted, under which this particular sewer project is to be constructed, we have come to the conclusion that the terms which you suggest are inequitable in several particulars.

In the first place your proposal would require us to accept now an undetermined financial burden in the future, in addition to the present cost which we are asked to assume. This we are not in a position to do.

Second, we doubt that the City has requested other property owners or industries to contribute such a large proportion of the cost in similar projects under circumstances where no corrosive liquids are discharged into a sewer system by such property owners or industries, as is the case with the Union Pacific now. We are sure the City does not ordinarily call upon the inhabitants o the property owners in an area to finance projects of this nature or

OVER

anyasis such as now suggested. The portion of the cost of thiproject which we are asked to assume would therefore appr to be somewhat unfair.

Third, it seems to us that those who will benefit mosfrom the proposed project are the real estate promoters whoave developed this area for residences and that these pede might fairly be asked to make some greater financial coribution to the project than is now suggested.

Fourth, it is apparent that these promotors propos to extend their operations at least as far to the north as he end of the planned pipe line, with the result that thesolution now suggested is obviously inadequate to solve theproblem permanently. Under your proposal it is therefoi to be anticipated that still further requests will be mad of us in the future, primarily to benefit these promoters with the result that we may be bearing a very substantia expense which we feel should in part at least be the resonsibility of the City, the real estate promoters, and theproperty owners to be benefited.

We are agreeable to bearing a fair and reasonable proportion of the expense but we cannot agree that we should absrb expense which equitably should be borne by others.

Yours very truly,

E. C. Carlson

August 14, 1951

Mr. F. C. Paulson, District Manager
Union Pacific Railroad Company
Union Pacific Bldg. (No.10 So. Main St.)
City

Utah Oil Refining Company
Utah Oil Building
City

Attention: Mr. F. R. Clark, Vice President

Gentlemen:

Further in connection with our recent meetings in the office of Commissioner Joe L. Christensen, Commissioner of Streets and Public Improvements, Salt Lake City, Utah, at which meetings your representatives have been present to discuss the proposition of piping the waste water drainage now flowing in open ditches in vicinity of 9th to 13th North Streets, West of 7th West Street in Salt Lake City.

As agreed at our last meeting held August 2nd, the City Engineer has prepared an estimate of the costs of the proposed drain line, together with a map showing generally the new location, and copies of same are attached for your information.

In line with attached estimate we submit the following figures as a fair suggested and proposed distribution of costs for doing the above work, to alleviate a very obnoxious and bad drainage condition now in existence. ~~This~~ Drainage ditch carries water from the Utah Oil Refining Company, the Union Pacific North Yard area and other drainage from the City.

Because of the obnoxious odors, the fine spray of oil on adjacent houses on 9th North Street in the vicinity of this ditch numerous complaints are received by the City, and something must be done to correct this condition. We have discussed this matter and feel that those causing the nuisance should pay proportional costs and further that the work shall be done as soon as possible.

Union Pacific Railroad Company

Utah Oil Refining Company

August 14, 1941

The nature of the waste drainage from the Utah Oil Refining Company will necessitate the painting of the pipe to limit the attack on the concrete pipe, which is much cheaper to install. This cost would be chargeable to the Utah Oil Refining Company. The City will assume the responsibility of securing needed rights of way for the pipe line in addition to their proportion of costs. The proportional costs arrived at in line with attached estimate are as follows:

Estimated cost of project	$39,787.50
Less Cost of painting interior of pipe	4,060.00
	$35,727.50

Divided as Follows:

Utah Oil Refining Co. 1/2 + cost of painting	$14,923.75
Union Pacific Railroad Co. 1/4	11,431.87
Salt Lake City Corporation 1/4	11,431.88
	$39,787.50

It is hereby understood that this cost involves the work of constructing said pipe line to 13th North only and that the City will assume ordinary maintenance of said pipe drain line; but in the future if any major repairs or changes are required to further handle this sewer it shall be the responsibility of the above, their heirs or assigns to stand their proportional costs for doing the work, which will be incorporated in the agreement to be executed by all concerned. The amounts of money above outlined shall be deposited with the Salt Lake City Treasurer and will be held in trust for the completion of this project only, and the City Engineer will arrange for the securing of materials and constructing said drain pipe line in accordance with City specifications and under his supervision.

Your prompt response in this matter will be greatly appreciated, and again thanking you for your cooperation in this important matter, I am,

Very truly yours,

LWW:fc
cc: Comm. Joe L. Christensen
Mr. E.H.Christensen

Roy R. Nelesse
City Engineer

July 31, 1951

Mr. Edward J. Holmes
893 Poinsetta Drive
C i t y

Dear Sir:

Further regarding the drainage problem confronting the City in connection with the plans for piping the waste water drainage from Utah Oil Refining, Union Pacific Railroad and others, in vicinity of Ninth North North Street, west of Seventh West Street and northerly.

A meeting has been called for Thursday, August 2nd, 1951 at 2:30 o'clock pm. in my office to again review this situation which we feel is in need of immediate attention.

Kindly arrange to be present yourself, with such others who may be vitally interested, so that this matter may now be discussed fully in line with latest developments.

Very truly yours,

LWW·fc

Commissioner of Streets
and Public Improvements

FORM 2104

UNION PACIFIC RAILROAD COMPANY

DEPARTMENT OF OPERATION
SOUTH-CENTRAL DISTRICT

F. C. PAULSEN,
GENERAL MANAGER

M. O. WILLIAMS
ASSISTANT TO GENERAL MANAGER

15 SOUTH MAIN STREET
SALT LAKE CITY 1, UTAH

June 26, 1951

9193-3-G

Board of Commissioners
City and County Building
Salt Lake City 1, Utah

(Attention Mr. Joe L. Christensen,
Commissioner of Streets and Public
Improvements)

Gentlemen:

Referring to City Recorder Bitner's letter of June 7th, attaching copy of communication presented by Mr. Roy W. McLeese, City Engineer, dated May 25th, addressed to the Hon. Joe L. Christensen, Commissioner of Streets and Public Improvements, regarding the proposition of changing location of and piping for the waste water drainage now flowing in open ditch in the vicinity of Ninth North, west of Seventh West Street, which ditch carries water discharged from the Utah Oil Refining Company, Union Pacific Railroad Company, and City storm sewer, as well as the City's Hot Springs:

The City Engineer's communication is at great variance with report submitted by Mr. Christensen under date of October 2, 1950, apparently for the purpose of shuffling the expense to be assumed by the various parties involved, and certainly is a radical departure from the proposal in which the Union Pacific Railroad Company had indicated a willingness to participate. If there is any intention to progress this matter in the near future, I think it would be advisable for all concerned to know just what is contemplated before definite action is taken.

Yours very truly,

F. C. Paulsen

47D

May 25, 1951

Hon. Joe L. Christensen
Commissioner of Streets
& Public Improvements
C i t y

Dear Sir:

Regarding the proposition of changing location of and piping for the waste water drainage now flowing in open ditch in the vicinity of Ninth North, west of Seventh West Street, and which ditch carries waste water discharged by the Utah Oil Refining Co., the Union Pacific Railroad Co., City storm sewer and other various drainage.

Because of the urgency of doing something to alleviate this niusance, and as agreed at our last meeting in your office, where representatives of the above organization were present, that consideration would be given to piping this waste water, when the Engineering Department completed a further study and made an estimate of costs for the needed work, said costs to be divided between various users of the drain ditch and submitted to them for final action. This has now been accomplished.

It is suggested that this waste water be piped in a 42 inch diameter reinforced concrete culvert pipe, standard strength, except at crossing of proposed Speedway, where double strength pipe will be required. The location of proposed pipe line, in order to secure rights of way more readily, will be upon land to be acquired by the State for the new Speedway. The State have tentatively agreed to this proposal providing we locate the pipe line within their proposed right of way, giving proper description and submitting to them for final approval.

The total length of 42 inch diameter pipe required is approximately 3800 lineal feet, of which 250 lineal feet shall be extra strength. There will be also an approximate length of 520 lineal feet of 24 inch diameter concrete culvert pipe to be laid to take care of drain water at Eleventh ~~West~~ North Street. A total of

47D

Page 1 h ~~Status~~

Hon. Joe L. Christensen

May 25, 1951

twelve standard concrete cleanout boxes and one special concrete inlet box will be required; the 12 inch water line along North 3th West Street will have to be lowered and arrangements for pumping the waste water during construction of special inlet box must be made.

The total estimated cost to complete this entire project is $89,787.50, including everything but the costs for rights of way. It was my understanding that the Utah Oil Refining Company and the Union Pacific Railroad Company would divide the cost of pipe, boxes, materials, etc. and the City would do all excavation and work of laying pipe, pipe bedding gravel, constructing boxes, etc.

The distribution of the costs, based upon the above total estimate, would be as follows: Utah Oil Refining Co. $43,711.77; Union Pacific Railroad Co. $21,855.88 ; Salt Lake City $24,219.85. It was also agreed that any costs involved for rights of way would be paid by said Utah Oil Refining Co. and U.P.R.R. Co.; however, the present outlook would appear that if proper arrangements can be made no costs will be involved for this purpose. No money was set up in above estimate.

I presume you may want to discuss this matter with the Legal Department before official notification is sent to parties involved, and any further information from this Department will be gladly given. I would further suggest that this matter be given prompt attention, so if agreed upon work can get under way.

Respectfully yours,

Roy W. McLeese
City Engineer

LWM:bw

SALT LAKE CITY CORPORATION

ROY W. McLEESE
CITY ENGINEER

ENGINEERING DEPARTMENT

SALT LAKE CITY 1, UTAH

May 23, 1951

MEMO.

Mr. Roy W. McLeese
City Engineer
City

Dear Roy:

Regarding changing of and piping waste water ditch in vicinity of Ninth North and West of Seventh West, which has been causing so much trouble with oil and fumes from discharge waste, particularly from the Utah Oil Refining Company and the Union Pacific Railroad Company.

In making a study of this situation it is now suggested that the ditch be enclosed in a 42" diameter reinforced culvert pipe, standard strength, except at the proposed speedway crossing, where extra strength pipe shall be laid. All pipe to be coated with an approved acid resistant coating inside and outside. Pipe to be made using type II cement. Also an inlet ditch will have to be enclosed with 24" diameter pipe of the same as above described.

The location proposed, in order to secure the right of way more readily, will be generally along right of way proposed for new speedway; the State Highway Department have agreed to the proposal, I understand. Tentative location is shown on attached map.

The building of this line entails a great deal of expense and as tentatively agreed in past meetings the costs shall be borne by the organizations causing the nuisance. A tentative estimate has been prepared and is attached hereto.

Yours very truly,

LWM;fc

L. W. Myers.
Asst. City Engineer

470

October 13, 1950

Drainage North of 9th North Street

At the meeting held October 10, 1950, it was agreed that a new proposal would be prepared based on eliminating the Utah Ice and Storage Company water, and charging the cost of filling the present drain to Real Estate Promoters. Reference is made to proposal of September 1950.

Revised capacities provided will be:

		% 48"	% 54"
Utah Oil Refining Co.	6 cfs	13.95	11.54
Union Pacific Railroad	3 "	6.98	5.77
City	34 and 43 "	79.07	82.69

Costs to be apportioned on the above percentages will be $56,375 for 48-inch pipe and $212,190 for 54-inch pipe.

Costs for capacities provided:

48-inch pipe

Utah Oil		13.95%	$7,864.31
Union Pacific		6.98	3,934.98
City		79.07	44,575.71
	Total	100.00	$56,375.00

54-inch pipe

Utah Oil		11.54%	$24,486.73
Union Pacific		5.77	12,243.36
City		82.69	175,459.91
	Total	100.00	$212,190.00

Summary of Costs.

	Pipe Lining	48" Pipe	54" Pipe	Backfill	Totals
Utah Oil	$9,328.00	$7,864.31	$24,486.73		$41,679.04
Union Pacific		3,934.98	12,243.36		16,178.34
City		44,575.71	175,459.91		220,035.62
Promoters				$25,300	25,300.00
			Total Cost		$303,193.00

STREETS and PUBLIC IMPROVEMENTS

NORTHEAST DRAINAGE and WASTE WATER PROBLEMS

Meeting: October 10th, 1950; 2:30 P.M.

Office: Commissioner Christensen

The following were invited to attend:

Mr. F. C. Paulsen, District Mgr.	Union Pacific Railroad
Mr. F. R. Clark, Vice President	Utah Oil Refining Co.
Mr. M. N. McKendrick, Sewer Engr.	C i t y
Mr. E. R. Christensen, Attorney	C i t y
Mr. R. W. McDaese, City Engineer	C i t y
Mr. J. B. Davis, Chief Engineer	Utah Ice & Storage
Mr. Alan E. Brockbank	428 East 2nd South
Mr. Edward J. Holmes	893 Poinsetta Drive

X invitations given X Status.

October 2, 1950

Mr. M. N. McKendrick
Sewer Engineer
C i t y

Dear Sir:

A meeting is hereby called to be held in my Office Tuesday afternoon, October 10th, at 2:30 o'clock, for the purpose of considering further the problem of piping the drainage waste through the northwest portion of the City, including the Utah Oil Refining Company, Union Pacific Railroad Company, Utah Ice and Storage and the City. Please arrange to be present or represented.

Report prepared by the Engineering Department as to proportionate costs will be discussed.

Yours respectfully,

LWM:fc:rr

Commissioner of Streets
and Public Improvements

October 2, 1950

Mr. Alan E. Brockbank
428 East Second South Street
C i t y

Dear Sir:

You are hereby notified of a meeting to be held in my office Tuesday afternoon, October 10th, at 2:30 o'clock to further discuss our Northwest Drainage and waste water problem, in which you are vitally concerned. Any representatives you desire to bring will be cordially welcomed.

As decided at our last meeting, the City Engineering Department have prepared a tentative outline as to location requirements and costs involved to take care of this situation to a point at approximately Seventeenth North Street and while this outline is not conclusive it gives us something tangible to work with. Copy of this report is attached for your study and comment at the above meeting.

Kindly advise if you will be represented.

Very truly yours,

LWM:fc:rr
Encl.

Commissioner of Streets
and Public Improvements

October 2, 1950

notice the date in reference to letter

Mr. J. B. Davis, Chief Engineer
Utah Ice and Storage Company
551 West 3rd South Street
P. O. Box 636
C i t y

Dear Sir:

Regarding discharge of waste water from your Union Pacific Plant into open drain ditch running North along Fourth West Street and eventually finding its way to our main outlet drainage system through the Northwest section of our City in a ditch jointly used by the Union Pacific Railroad Company, Utah Oil Refining Company and the City storm drainage.

Since the development of homes up to Ninth North Street and with future proposed development north through this area, a new drain line will have to be built to take care of this waste drainage, particularly north of Ninth North Street. The present open drain in this area is at present a duisance and emits very pungent odors.

The City is faced with the problem of relocating this drainage ditch and piping the waste water to a point approximately at 17th North Street and finds that the undertaking involves considerable study and expense.

A meeting was recently held in my Office with representatives of all groups concerned, at which meeting your group should have participated but I understand you were inadvertently overlooked. At this meeting it was decided that the City Engineer would prepare a route to be followed for this drain outlet, apportion the costs for all concerned for study of the various groups and these problems were to be further discussed at a future group meeting. Copy of City Engineer's findings are attached for your study and comment.

August 24, 1950

Union Pacific Railroad Company
Union Pacific Building
City

Attention: Mr. F.C.Paulsen,
Manager

Gentlemen:

This is to notify you of a meeting to be held in the office of Salt Lake City Commissioner Joe L. Christensen, Thursday, August 31st, 1950 at 2:30 o'clock P. M. for the purpose of further discussing the drainage ditch problem confronting the City Commission in the northwest area of the City and in which your Company is vitally concerned.

I believe your organization was represented in this matter previously by Mr. Ernest Sawyer, Tax Agent; Mr. J. W. Godfrey, Division Engineer and Mr. Corey from your Legal Department, whom we cordially invite to be present, together with other representation you desire.

Very truly yours,

LWM:fc

City Engineer

July 1950

PRELIMINARY REPORT

Pipe Line for Storm Water and Industrial Waste Water North of 9th North Street.

The proposed pipe line would carry storm and waste water from the existing open drain at 7th West and 9th North, west along 9th North in a 48 inch pipe to Marion Street where an existing storm sewer laid in American Beauty Drive, discharges into the open drain, thence in a 54 inch pipe northerly along Marion Street, on the westerly side of the open drain, to 15th North, thence northwesterly to the vicinity of 17th North and connects with the existing open drain.

The preliminary estimate of cost is as follows:

48 inch pipe - 2050'	@ $30.00 - - - - - -	$61,500.00
54 inch pipe - 6000'	@ $35.00 - - - - - -	210,000.00
Engineering and contingencies @ 20%	- - -	54,300.00
	Total	$325,800.00

Based on information available in this office, the 48 inch pipe will carry 32 cubic feet per second, and the 54 inch pipe, 44 cubic feet per second.

The capacities provided are as follows:

Utah Oil Refinery	6 c f s	
Union Pacific Railroad	3 c f s	
Utah Ice & Storage	1 c f s	
Warm Springs (Sulphur water)	3 c f s	Estimated
5th North storm sewer	5 cf s	do.
American Beauty storm sewer	18 c f s	
	36 c f s	

Estimated costs for capacities provided are as follows:

	48" - Cost $73,800.00		54" - Cost $252,000.00		
	%	Amount	%	Amount	Totals
Utah Oil	18.75	$13,837.50	13.6	$34,272.00	$48,109.50
Union Pacific	9.4	6,937.20	6.8	17,136.00	24,073.20
Utah Ice	3.1	2,287.80	2.3	5,796.00	8,083.80
City	68.75	50,737.50	77.3	194,796.00	245,533.50
	100.0	73,800.00	100.0	252,000.00	325,800.00

It is believed that the pipe sizes of 48 inch and 54 inch will not be materially changed when accurate measurements of st rm water flow have been determined. High water marks in existing 48 inch culverts

show that the proposed 48 inch section of the pipe line will be required to carry storm water and waste water which can be anticipated in the future.

Respectfully submitted

MNM/rh

M.N. McKendrick, Asst. Eng. - Sewers

November 28, 1949

Hon. John B. Matheson
Commissioner of Streets
& Public Improvements
C i t y

Dear Sir:

In connection with our "Preliminary Report On Drainage Pipe Lines For Northwest Part Of City", submitted to you under date of November 14, 1949, the following additional information is submitted to you.

1. Flow from Utah Oil Refining Company, furnished by Mr. Clark on November 26, 1949.
Flow from Refinery 800 to 1100 gallons per minute (1.8 to 2.5 cfs.)
Upstream from Refinery discharge point, 800 gallons per minute, more or less (1.8cfs)
Refinery requirement four to six cubic feet per second

2. Flow from Union Pacific Railroad Shops, furnished by Mr. Godfrey on November 26, 1949.
Combined flow 1.4 cubic feet per second
Maximum capacity required 3 cfs.

3. Flow from Ice Plant — no pollutants.
No information received from Utah Ice & Storage Co.

The above information of required capacity in a pipe line will not materially change the preliminary studies submitted to you on November 14.

Based on the meeting held in your office on November 14, a pipe line to carry wastes of sulphur water, some storm water, railroad and refinery oily wastes and ice plant water would

6

Page 1 has ✗ status

start at 7th West near 9th North and run westerly and northerly to a point 4,000 feet north of 9th North. The data are as follows:

Length of pipe	7,050 feet
Pipe - 36-inch vitrified clay	
Cost per foot	$29.67
Total cost	$210,000.00
Discharges as follows:	
Drainage - storm, etc	2.0 cfs.
From Ice Plant	1.0 cfs.
Sulphur water	3.0 cfs.
U.P.R.R	3.0 cfs.
Utah Oil Co.	6.0 cfs.

Proportionate costs would be as follows:		
Ice Plant	6.7%	$14,070.00
City	33.3%	69,930.00
U.P.R.R.	20.0	42,000.00
Utah Oil	40.0	84,000.00
Total	100.0%	$210,000.00

Respectfully yours,

City Engineer

MHM:bw

November 14, 1949

PRELIMINARY REPORT ON DRAINAGE PIPE LINES FOR NORTHWEST PART OF CITY

Statement of the Problem:

The area beginning at 4th West and 5th North Streets and extending northerly into Davis County and Westerly to the Jordan River is crossed by a number of open drains which carry storm water, warm sulphur water, wastes from Union Pacific Railroad Shops, waste water from ice loading plant at 4th North and 4th West, wastes from Utah Oil Refining Company, and in emergency, sanitary sewage from Sewage Pumping Station at 9th North and 11th West. The sewage from the Pumping Station is normally carried through a 60-inch diameter concrete pipe line, to a point in Davis County about one mile north of the City Limits, where sewage from the City Gravity Outlet Sewer, open drain canal and pumped sewage join and flow into the Northwest Drainage Canal.

oily, acid wastes" see page 8 of report

The area north of 9th North and west of 8th West is being considered for extensive development, which means that troublesome wastes now being carried in open drains must either be excluded from the drains or carried in pipe lines to a point beyond expected development.

Consideration must be given to the future construction of a sewage disposal plant, which precludes the construction of one pipe line or conduit to carry all wastes north of 9th North Street, since the load on a disposal plant must be kept to a minimum, and sulphur water and oily wastes would seriously impair the operation of such a plant.

The Sulphur water and oily wastes must be carried in a pipe which will not be disintegrated by their chemical action. The best pipe found for carrying such wastes is vitrified clay or reinforced concrete lined with vitrified clay liner plates.

Page 1 has * stats

Pipe Lines Required:

Three separate wastes must be provided for: sanitary sewage, storm water, and oily wastes and sulphur water. Consideration must also be given to the location for a future gravity outlet sewer which will have to be constructed adjacent to pipe lines carrying the above wastes, so that there will be no interference with such construction.

Consideration has been given to the construction of four pipe lines, a 72-inch diameter reinforced concrete pipe line to carry pumped sewage; a 48-inch diameter reinforced concrete pipe line for storm water; a 36-inch diameter vitrified clay or a reinforced concrete pipe lined with vitrified clay liners to make a 36-inch diameter pipe for sulphur water and oily wastes; and a reinforced concrete pipe lined with vitrified clay liners, starting with 36-inch diameter and increasing to 60-inch diameter, to carry combined sulphur water, oily wastes and storm water.

Pages 1 thru 4 have X Important

November 14, 1949

Status

Pipe Line No. 1.

This pipe line would carry sewage pumped at the Pumping Station, 9th North and 11th West Streets in a pipe line parallel with the existing 8-foot diameter concrete pipe line now carrying sewage from the Pumping Station. The existing pipe line at many times is required to carry its maximum capacity of approximately 80 second feet. A new pipe line will have to be constructed before the open drain ditch north of the Pumping Station can be filled in, because it is used as an emergency outlet whenever the existing pipe line cannot be used.

The existing pipe cannot now carry the sewage which may be pumped by operating the two 40-second foot pumps at the same time, and accordingly a pipe of 8-foot diameter reinforced concrete is proposed, which will carry such discharge, the length to be approximately 16,000-feet. Approximate quantities and costs are as follows:

Trench excavation and backfill 37,900 cubic yards at $1.50	$ 55,800.00
Furnish and lay 72" R.C.P. 16,000 lineal feet at $33.00	528,000.00
Gravel in bottom of trench 6,400 tons at $3.00 per ton	19,200.00
Omissions, Contingencies and engineering 20%	120,800.00
Total estimated cost	$ 724,800.00
Cost per lineal foot	$ 45.30

In order that the sewage may be confined within pipe lines to the present point of discharge in Davis County, the entire length of 16,000 lineal feet of pipe will have to be constructed.

Pipe Line No. 2.

This pipe line would carry wastes from the U. P. Railroad Shops, waste from Utah Oil Refining Company, sulphur water wherever intercepted, storm water draining to vicinity of 4th West and 5th North, and waste water from ice loading docks near 4th North and 4th West. The probable maximum flow at 7th West north of 9th North and below the inflow from the Refinery would be about 10-second feet as follows:

From ice plant	0.5 cfs
Drainage to 5th No. at 4th West	2.0 "
From Wasatch Springs (sulphur water)	3.0 "
From U.P.Shops (combined flow)	3.5 "

From Utah Oil Refinery	1.1	cfs
Total	10.1	cfs

Additional maximum flow to be carried in the pipe line between the above point and the end of the line approximates 5-second feet. Under the contract between Salt Lake City and Utah Oil Refining Co., the City must provide capacity for 6-second feet for the Refinery, which will require a total capacity at the end of the pipe of 21-second feet. A pipe line smaller than 36-inch diameter will not carry the required flow of 15-second feet at 7th West and 9th North.

Subject to detailed study and measurements of inflows, it is proposed that a 36-inch diameter pipe line of vitrified clay or reinforced concrete with vitrified clay liner plates be constructed for a length of approximately 22,600 feet. Approximate quantities and costs are as follows:

Trench excavation and backfill 23,000 cubic yards at $1.50	$ 34,500.00
Furnish and lay 36" vitrified clay pipe 22,600 lin. ft. at $22.50	508,500.00
Gravel in bottom of trench 5,600 tons at $3.00	16,800.00
Omissions, contingencies and engineering 20%	112,000.00
Total estimated cost	$ 671,800.00
Cost per lineal foot	$ 29.67

By using reinforced concrete pipe with vitrified clay liners the costs are as follows:

Trench excavation and backfill 23,000 cubic yards at $1.50	$ 34,500.00
Furnish and lay concrete pipe with tile liners 36" diameter, 22,600 lin. ft. at $18.00	406,800.00
Gravel in bottom of trench 5,600 tons at $3.00	16,800.00
Omissions, contingencies and engineering 20%	91,600.00
Total estimated cost	$ 549,700.00
Cost per lineal foot	$ 24.32

Approximately one-half of the pipe line or 11,000 feet would have to be constructed to remove the wastes to a point 4,000-feet north of 9th North Street.

Pipe Line No. 3.

This pipe line would carry drainage from the areas adjacent and to the east of the above proposed pipe line and also discharge from existing storm sewers and ditches. The additional estimated flow considered north of 9th North, would approximate 7-second feet. After including the flow of existing storm sewers, a capacity of approximately 25-second feet is required, which can be carried in a 48-inch diameter pipe.

Subject to detailed study and measurements of inflows, it is proposed that a pipe line be constructed for a length of approximately 16,900 feet of 48-inch diameter reinforced concrete pipe. Approximate quantities and costs are as follows:

Trench excavation and backfill 27,600 cubic yards at $1.50	$ 41,400.00
Furnish and lay 48" diameter R.C.P. 16,900 lineal feet at $18.00	304,200.00
Gravel in bottom of trench 5,000 tons at $3.00	15,000.00
Omissions, contingencies and engineering 20%	72,100.00
Total estimated cost	$ 432,700.00
Cost per lineal foot	$ 25.60

Approximately 5,200 lineal feet of pipe line would have to be constructed to remove the storm drainage to a point 4,000 feet north of 9th North Street.

Pipe Line No. 4.

This pipe line would carry the combined flow of sulphur water, oily acid wastes and storm water. It would consist of 36-inch diameter pipe of reinforced concrete lined with vitrified clay liner plates to a point where the storm sewer at 9th North and 9th West enters the open drain, and 60-inch diameter pipe of reinforced concrete lined with vitrified clay liner plates from that point to the end of the pipe line. Approximate quantities and costs are as follows:

Trench excavation and backfill 36,000 cubic yards at $1.50	$ 54,000.00

NWOD
Doc #22, Item #175
Amoco 104(e) response

SALT LAKE CITY, UTAH

Report on Sewage Disposal

City Commissioners

Earl J. Glade, Mayor

John B. Matheson
L. C. Romney
D. A. Affleck
Fred Tedesco

W. D. Beers, City Engineer
Louis E. Holley, City Auditor

Greeley and Hansen
Engineers
Chicago 4, Illinois

December, 1947

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In addition to the total population, it is also important to determine the distribution of population into various sewer districts. Such population distribution data are given in Table 7. The present population distribution has been estimated on the basis of registration of voters in the various voting precincts and in part on the basis of house counts reported in the W.P.A. Real Property Survey report of August, 1941. The forecasted future population distribution has been based upon present densities and anticipated future land uses.

6. Industrial Development and Sewage Contributions

The industries which should be given consideration in connection with sewage disposal include the following:

a) Packing Plants

1. Cudahy Packing Co. (in Davis Co. north of city)
2. Block & Guss (in city tributary to gravity sewer)

b) Brewery in City. Fisher Brewing Co. (tributary to sewage pumping station)

c) Utah Oil Refining Co. Large quantities of water discharged into city outfall sewer canal

d) Packing Plants. In county south of city

e) Metal Working Plants. (Tributary to both sewers)

f) Creameries

g) Bottling Works

TABLE 7

Population Distribution

Sewer District	Area in Acres		Population Density Persons per Acre		Population	
	Present	Future*	Present	Future	Present	Future
1	327	327	9.0	13.0	2,940	4,240
2	595	667	4.5	12.0	2,670	8,000
3	2,100	2,300	6.0	11.0	12,600	25,100
4**	510	1,075	14.0	13.9	7,170	15,000
5	1,895	2,840	12.9	18.0	24,560	51,000
6	784	784	11.0	16.0	8,620	12,500
7	617	617	12.5	15.0	7,700	9,240
8	153	153	6.0	9.0	920	1,380
9	258	258	12.0	14.0	3,100	3,600
10	23	23	13.0	14.0	300	320
11	2,220	3,580	4.0	9.0	8,830	32,000
12	955	955	12.0	12.0	11,450	11,450
13	235	1,340	8.5	9.0	2,000	12,050
14	63	500	1.6	9.0	100	4,500
15	497	1,060	10.0	14.0	4,970	14,830
16	440	440	16.0	20.0	7,040	8,800
17	1,770	1,930	18.5	24.0	32,800	46,400
18	161	161	7.0	13.0	1,120	2,080
19	1,465	2,025	19.0	25.0	27,800	50,380
20	428	428	1.0	5.0	430	2,130
Total	15,496	21,463	10.3	14.6	160,000	300,000
S.S. Lake					7,160	15,000
Total, including S. S. Lake.					167,160	315,000

* Does not include areas west of the Jordan River not sewered at present, except an area tributary to the Redwood Road Sewer estimated on a basis of 5,000 G.A.D.

** Sewer District Number 4 is South Salt Lake Town and is outside the city boundary.

There is some evidence that an active industrial development may be expected in the future.

Cudahy Packing Co.

This plant is located just west of the D. & R.G.W.R., and U.P. Ry. about 1½ miles north of the Davis County line. The Salt Lake Union Stock Yards are immediately to the north of the packing plant and should be included in the consideration of sewage disposal. There is an agreement with the City relative to disposal of industrial wastes into the city sewage canal.

The Packing Co. receives its water supply from wells operated by the Union Stock Yards Co. The average daily quantity of water used was reported verbally to be as follows:

a) Statement by the Packing Plant Superintendent - 300,000 gallons per day

b) Statement by a Mr. Mitchell of the Union Yards - 475,000 to 500,000 gallons per day pumped from 15 wells of which about 300,000 gallons per day goes to the Packing Plant and 200,000 gallons per day to stock watering and to washing down pens.

The Plant Superintendent, Mr. Robert Lein, furnished the following data on sewage flows from the killing floor:

Hour of Day*	Total Gallons*	Computed Rate G.P.M.
8 to 10 A.M.	29,520	246
10 to noon	29,520	246
N. to 2 P.M.	24,000	200
2 to 4 P.M.	37,200	310
4 to 6 P.M.	29,520	246
6 to 8 P.M.	24,000	200
8 to 10 P.M.	10,800	90
10 to midnight	10,800	90
M. to 2 A.M.	6,000	50
2 to 4 A.M.	6,000	50
4 to 6 A.M.	6,000	50
6 to 8 A.M.	10,600	88
Total	234,160	163 (Ave.)

*Data given by Mr. Lein

The sewer from the killing floor discharges into a grease separator, a tank about 35 feet long, 5 feet wide, and 4 feet deep. Visual observations at 2:30 P.M. August 20, 1947, indicated poor efficiency of operation of this separator.

In addition to the sewer from the killing floor, a second sewer carries paunch washings into a manure trap basin, and a third sewer carries the domestic sewage to a point of discharge into the outlet drain (Drain 119) beyond the two traps or separator tanks.

Mr. Lein stated that in the future the plant would operate up to the plant capacity determined by the ratings permitted by the Animal Inspecting Bureau of the Department of Agriculture

which he stated that for this plant are as follows:

Cattle	28	an hour
Hogs	130	" "
Sheep	120	" "
Calves	40	" "

He classified the plant as a simple species plant, namely, only one type of animal is killed at one time, and estimated the following hours of killing per week (5 days) for each type of animal:

Cattle	- 20 hrs.	or 560	animals	per	week
Hogs	- 10 "	" 1300	"	"	"
Sheep	- 5 "	" 600	"	"	"
Calves	- 5 "	" 200	"	"	"
Total Animals		2,660	per week		

Mr. Lein stated that during the last year or two O.P.A. regulations have not permitted them to operate at full capacity.

The City Department of Health has furnished the following figures for recent operations of this plant:

July, 1947	Actual
Cattle	1,532
Sheep	1,298
Hogs	147
Calves	841
Total	4,233

The Union Stock Yards discharge considerable dirty water into Drain 119 below the outlet of the Packing House sewers. Mr. Mitchell, an employee, estimated the water used by the

Salt Lake Union Packing Company Yards at about 200,000 gallons per day. This water, in part runs through drinking water troughs, thence to waste and in part is used to wash from time to time the floors of the pens.

During the time of the visit there was no washing of floors in pens. The flow in the open ditch below the sewer outlets appeared to be much greater than the 475,000 to 500,000 gallons per day stated by Mr. Mitchell. High growth of weeds and grass made it quite difficult to make any close estimates of flow or to locate sources of ground water contributions. The drainage lines through the Stock Yards and Packing Plants are all underground closed lines difficult to locate. It is possible that drainage from irrigation channels gets into Drain 119 in addition to the flow and seepage from the Stockyards and the Packing Plant.

At the time of the field inspection (August 18, 1947) the entire strong and odorous flow from Drain 119 had been diverted into the Old Sewer Outlet by farmers to the northwest who use this packing house sewage for irrigating. These farmers have a lease to use certain city lands and the privilege to use city sewage for irrigating water.

Inasmuch as these two plants are outside the city limits, the city is under no obligation to treat their wastes. Packing-house wastes are very strong and require considerable more

treatment than doemstic sewage.

We estimate that the wastes from the Cudahy Packing Company would have a population equivalent of about 8,500.

Block & Guss Packing Plant

This is a small plant located at 1672 Beck Street with a sewer connecting into the main gravity outlet sewer in Beck Street at this point.

The following data was furnished to use by Mr. Block on a visit made August 20, 1947:

Cattle - 400 per month
Lambs - 700 " "
Calves - 250 " "
Hogs - None

Water bill average $60.00 per month, $86.00 for July, 1947.

At this plant the blood, washing water, and all the paunch manure is washed into the sewer. The offal and miscellaneous items are carefully collected into a dry basin and disposed of to a rendering plant.

The kill is small and the wastes from this plant would have little effect upon the sewage characteristics from a city the size of Salt Lake City. The paunch manure should not be permitted to enter the sewer.

Fisher Brewing Company (10th West and 2nd South)

The liquid wastes from this plant are discharged into a sewer tributary to the sewage pumping station. A visit to the

plant resulted in the following data furnished by Mr. Bill Fisher:

(a) Mash is used for cattle feed while the hops are burned.

(b) Wash water from the brewery and a bottling plant is discharged into the sewer.

(c) In the bottling plant the bottles are washed in cleaning tanks in which the cleaning solution is changed from time to time. A loading is equal to about 80 hours of bottling. For each loading, cleaning chemicals are used as follows:

600 lbs. caustic soda
90 lbs. borax
40 lbs. phosphate
4 cleaning tanks, 2,500 gallons, total 3½% caustic
70-80 lbs./day to maintain
50 loadings per year

(d) The brewing of beer from Aug., 1946 to Aug., 1947 was about 112,000 barrels (31 gal. each). A new 6,000 barrel storage cellar will increase the plant output about 20 per cent, namely, 20,000 to 23,000 barrels per year. Production varies seasonally about as follows:

10,000 barrels in Dec., 1947
15,000 " " July and August, namely, variation of about 50%

It requires a minimum of 6 to 7 weeks to produce properly aged beer.

(e) Water consumption quantities were taken from monthly water bills as follows:

Month		(Water Consumption per Month- 1,000 Cubic Feet) Brewery	Bottle House	Office	Total
1946					
	August	2,497	1,875	191	4,563
	September	2,811	2,541	201	5,553
	October	2,553	2,070	217	4,840
	November	2,420	2,774	101	5,295
	December	2,440	2,197	34	4,671
1947					
	January	2,112	2,035	49	4,196
	February	2,160	1,895	51	4,106
	March	2,230	1,730	45	4,005
	April	2,547	2,313	67	4,927
	May	2,585	2,082	133	4,800
	June	2,460	1,823	238	4,621
	July	2,338	1,653	188	4,179
	Totals	29,153	24,988	1,515	55,756

(f) Employees, 65 to 80.

Wastes from the brewing of 15,000 barrels of beer per month will have a population equivalent of about 4,600.

Utah Oil Refining Company

An inspection visit was made to the Utah Oil Refinery August 20, 1947. Mr. Hugh Thompson, Chemical Engineer, answered ques-

tions and showed us around.

Three drainage lines flow west from the refinery grounds. One drain, Drain No. 3-D, near North end, originating at Gambusia Rearing Ponds, is supposed to be entirely enclosed and to receive no wastes as it crosses the plant site.

Two pipe lines discharging into Drain No. 3, just north of 9th North Street carry most of the waste drainage from the refinery. One pipe carries mainly condenser and cooling water. The other pipe takes the effluent from an oil separator comprising 4 tanks each 37x10x4 feet deep equipped with mechanical sludge collectors and oil skimmers of the endless chain type. Casual observations during the inspection trip seem to indicate a very low operating efficiency for these tanks. The effluent was quite dark and had considerable oil in it.

Observations in the Drainage ditch at the point of discharge also indicated that considerable oily material was being discharged.

Measurements of the flows from the refinery made on August 22, 25, and 27, indicate the total flows as follows:

Date	Gallons per Minute
8-22-47	740
8-25-47	1000
8-27-47	635

The wastes contain upwards of 700 parts per million of chlorides, as much as 1,300 parts per million of suspended solids, and have a pH ranging from 6.9 to 8.2.

Drain No. 3 flows northwesterly into City Drain No. 2 which eventually enters the open outfall sewer just above the Jordan River syphon.

In addition to the foregoing there are two additional items of waste products:

(a) Lime sludge from a water softening plant which is hauled away, although the filter backwash water carries considerable into the drains.

(b) Spent Acid - sulphuric acid - some losses into drains, but most of this acid waste is hauled to a dump in field pits. It is rumored that much of the spent acid is dumped directly into drainage lines near the open outlet sewer. This causes odor troubles.

Packing Plants South of Salt Lake City

There are several slaughter houses and packing plants south of Salt Lake City limits, which discharge their wastes into Jordan River, including the following:

a) Joe Doctorman & Son Packing Co., 3400 S. 9th West

b) Joe Doctorman & Son Packing Co., 2900 S. 2nd West

c) Archie McFarland & Sons, 2922 S. State

d) A. Bills & Company in Sandy

e) Granite Meat - in Murray (Has own disposal plant)

A new plant not yet in operation.

No visit was made to these plants, but the following typical data on kills will indicate the magnitude of these plants:

Doctorman No. 1 (July,1947)

Cattle - 344
Sheep - 80
Veal - 114
Hogs - None

Doctorman No. 2 (May,1947)

Cattle - 391
Sheep - 169
Veal - 140
Hogs - None

Archie McFarland & Sons

Federally inspected about same capacity as Cudahy.

A. Bills & Co. (July, 1947)

Cattle - 261
Sheep - 369
Hogs - 144
Calves - 159

Granite Meat in Murray (July, 1947)

Cattle - 594
Sheep - 289
Hogs - 3
Calves - 162

Inasmuch as wastes from these plants do not enter the city sewers, they have no special bearing upon the problem of sewage disposal for Salt Lake City.

Metal Working Plants

There are a considerable number of foundries, machine shops, structural steel works, and other metal working plants, some of which quite likely discharge substantial quantities of waste waters into the sewerage system. Some index of the waste quan-

tities is shown by data on large water users.

There is, however, no evidence that any unusual quantities of wastes are produced by these industries.

Some of the large plants are as follows:

Name	Address	Employees
American Foundry & Machine Co.	870 S. 4th West	150
Armco Drainage & Metal Products Co.	631 S. 3rd West	-
Carrer Sheet Metal Works	134 W. Broadway	25
Christensen Machine Co.	1975 S. 2nd West	75
Eimco Corporation	634 S. 4th West	-
Industrial Steel Co.	475 W. 6th South	30
The Land Co., Inc.	267 W. 1st South	150
Lundin & May Foundry Co., Inc.	454 W. 5th North	35
Salt Lake Cabinet & Fixture Co.	136 S. West Temple	75
Structural Steel & Forge Co.	545 W. 7th North	-
Linde Air Products Co.	-	-

The chief constituent of wastes from metal working plants which should not enter the sewers is pickle liquor.

Creameries

Several creameries operate within the city limits, the largest including

Arden-Sunfreze Creameries, 1030 S. Main St.
Brooklawn Creamery Co., 260 S. 1st West
Mountain States Creamery Co., 226 W. South Temple

The City Engineer, the City Health Department, and the Chamber of Commerce reported these to be not exceptionally large, so their wastes may be considered as a normal component of city sewage.

Bottling Works

A number of bottling plants discharge a limited amount of wash water into sewers. These plants include the following, among others:

Canada Dry Bottling Co. of Utah, 25 S. 3rd East
Birrell Bottling Co., 264 Glendale Ave.
Coca-Cola Bottling Co. of Utah, 875 S. West Temple
Mission Orange Bottling Co., 235 E. 5th South
Nehi Beverage Co. of Utah, 155 E. 1st South

Summary

The Cudahy Packing Plant wastes and the Fisher Brewing Company wastes are the two most important industrial wastes which need be considered for sewage disposal. Any treatment plant should include capacity for the brewery wastes. Inclusion of the wastes from the Cudahy Packing Company after some pretreatment at the packing plant is a matter of city policy.

It would appear that the oil refinery wastes should not be taken into any sewage treatment plant. (1) Objectionable quantities of oil, spent acids, and lime sludge may be removed more economically at the refinery than in any sewage treatment plant. (2) Oils and phenols from the refinery would cause trouble and considerable operating expense. (3) There appears to be no

serious objection to discharging these wastes into open drains, after proper treating, at the refinery.

The several slaughter houses in the county south of Salt Lake City would be part of the problem of the disposal of the sewage of Salt Lake City Suburban Sanitary District and should be considered in connection with that district.

7. Climatology

Salt Lake City has a semi-arid climate with definite wet and dry seasons requiring extensive irrigation during the warm months of the year.

Average monthly precipitation for the period 1874-1946 and average monthly temperatures for the period 1920-1947 are as follows:

Month	Precipitation in Inches	Average Temperature Degrees F.
January	1.31	29.2
February	1.46	33.8
March	1.95	41.7
April	2.00	49.6
May	1.86	57.4
June	0.84	67.4
July	0.56	75.7
August	0.85	74.5
September	0.88	64.4
October	1.52	52.5
November	1.43	41.1
December	1.42	31.9

11. Existing Sewerage

Salt Lake City is sewered on the separate system, storm water being discharged into the nearest waterways through open drains and a number of closed conduits, and the domestic sewage and industrial wastes being collected through a system of sanitary sewers and discharged into an open canal known as the Northwest Drainage Canal, which extends from near the center of Section 11, R1N, T1W, westerly to a siphon under the Jordan River, thence northwesterly to an outlet in Great Salt Lake.

The sanitary sewer system is made up of two main divisions, the Gravity System and the Pumping System. The main gravity outlet sewer starts at 4th East and 9th South and extends northwesterly to about 4th West and 9th North, thence north to Beck Street, thence northwesterly along and near Beck Street to a point of discharge into the upper end of the Northwest Drainage Canal about one-half mile south of the Cudahy Packing Plant and west of the railroad tracks.

The main trunk sewer of the pumping system starts at 27th South and Highland Drive and extends west to West Temple, thence north to 13th South, thence west to 7th West, thence north and west to the pumping station located at 9th North and 11th West. The pumping station raises the sewage approximately 18 feet and then it flows through a 60-inch closed conduit for approximately 16,000 feet, then through an open canal to a point of discharge

into the Northwest Drainage Canal, approximately one mile west of the outlet of the gravity sewer.

As presently arranged, approximately one-third of the city area, which is sewered at this time, is tributary to the gravity sewerage system and two-thirds to the pumping system. Considerable areas in the southeasterly portion of the city are of sufficient elevation to be discharged by gravity if a gravity outlet sewer were available.

The general arrangement plan of the sewerage system within the city limits is illustrated by Figure 7 and areas of various districts of the sewered part of the city are given in Table 7.

It appears from these data (Table 7 and Figure 7) that 15,496 acres presently included in the city is provided with sanitary sewers. Extensions of sanitary sewers are likely to serve additional areas aggregating a total of approximately 5,400 acres to the east and north of the presently sewered areas as illustrated by Figure 7.

Computations of sewer capacity related to the tributary area have been made at various points along the trunk line sewers and for certain major branch sewers. The sewer capacities have been computed on the basis of the diameter of the sewers and the sewer grades, assuming a roughness coefficient equivalent to a "Kutter's n of 0.015". The results of these computations are given in Table 18. A comparison of the per acre capacity and

lated to the future areas which may become tributary are as follows:

	Sewer Capacity	
	Present	Future
M.G.D.	8.2	8.2
Gal./Day/A.	35,000	2,930
(a) Area within City-Acres	235	1,600
(b) Plus outside Area- Acres	0	1,200

These computations indicate that the existing sewer along Redwood and 9th North Streets has insufficient capacity to provide a reasonable per acre capacity for the possible sewered area beyond the present city limits to the west and south. No relief, however, will be needed until the tributary area becomes considerably well built up and this will probably not be the case for many years in the future.

12. Receiving Waterways and Their Uses

All of the City's sewage is collected in two main sewers, one of which flows all the way by gravity to an open ditch just north of the city limits and the other which collects in a pumping station and is raised to a higher level and then flows by gravity to the same ditch. These two uncovered ditches unite to form the sewage canal. The sewage is siphoned under the Jordan River and then flows in a northwesterly direction to Great Salt

Lake. For the first nine miles the sewage is confined within the banks of the canal. In past years part of the sewage has been used for irrigation but this is not now allowed by the City Engineer's office.

About four miles above the inlet into Great Salt Lake the sewage spreads out into a vast swampy area and flows slowly through several channels. A considerable amount of grass and other vegetation including a few scrubby trees are found throughout the swamp and along the edges of the channels.

The sewage from these marshy areas again collects into a main channel and then flows out through the sand, finally re-dividing into two or three smaller channels and then flowing out into the bay of Great Salt Lake.

On September 30, 1947, a trip down the canal and over the surrounding area was made in a chartered plane. The plane cabin was enclosed so that it was impossible to make any observations of odors.

The area traversed by the canal is very sparsely settled, only 1 farm being observed. The soil is highly alkaline and the ground water level is high. Thus this area in its present state is not suitable for agricultural development.

The surface of the canal was covered at many points by dark brown oil which presumably was discharged from the Utah Oil Refining Company. At one or two points in the canal small floating

pieces of black sludge were observed. No gas bubbles or other signs of active decomposition were observed in the canal.

The sewage eventually enters Great Salt Lake. In flying over the lake no extensive areas of sludge banks were observed. The water was discolored somewhat and there were considerable areas covered with an oil slick. Gulls were observed fishing in the lake and in the sewage field where the canal has spread out to form a marshy area.

Antelope Island is no longer an island but due to the recession of the level of Great Salt Lake it has become joined to the mainland on the south, thus creating a bay.

The canal appears to have sufficient capacity and also appears to have been excavated in material which stands except nearer the lower reaches. At this point it is uncertain whether or not the banks have failed or accumulation of sludge deposits have caused overflow of the banks to form the marsh.

The beaches at Saltair and Black Rock are too far from the point of discharge of the canal to be affected by sewage contamination and the high concentration of salt in the water exerts considerable bactericidal action.

13. Need for Sewage Treatment

The need for sewage treatment is customarily determined by the need to protect reasonable use of the receiving watercourse, the need to remedy existing insanitary conditions which endanger

ENGINEERING DEPARTMENT

SALT LAKE CITY CORPORATION

SALT LAKE CITY, UTAH

H. JESSEN,
CITY ENGINEER
TER O. CANNON
ENGINEER
C. JESSEN
~~ASSISTANT~~

last page

August 2, 1926.

Mr. H. C. Jessen,
City Engineer,
City.

Dear Sir:

The following is a report of the investigation of the complaint of the Jordan Investment Co., #1-A - Tracts of land described as #1, 2, 2A and 4 show no signs of ever having been cultivated and have a growth of salt grass. The only use this could have been put to is for pasture, and grazing would have been poor. There is no evidence of a road over this ground and before the canal was constructed a large portion of this land was inundated. The drainage canal has enhanced the value of this land rather than damaged it.

#1. The old copper plant spur is entirely out of order, in fact there is no track that could be used. The spur has been disconnected for some time from the D. & R. G. W. main line for a distance of 125' and the switch taken out. The track to Marion Street is badly out of order and could not be used. West of Marion Street to the drainage canal part of the track is out and what is left is worthless. West of the drainage canal only 300' of the old track is left, all the rest has been hauled away. The grade is still there and if a new track were laid a bridge would be necessary to cross the drainage canal.

#2. The complaint must mean the SW 1/4 of Sec. 23 instead of the NW 1/4, as the NW 1/4 is described in #3. The drainage canal south of the north side of the SW 1/4 SEC. 23 for 3/4 the distance over the claimants property is along the east side of the old O. S. L. and Utah Oil Refining Company's ditch and at least 10' of the spoil bank on the west side of the drainage channel is in this ditch and should not be counted against the City for the right of way.

Refined

The width of the right of way in the complaint is excessive and measurement shows that for three fourths of the distance not more than 110' should be allowed considering 10' of the west side being in the old O. S. L. & Utah Oil Refining Company's ditch.

O.S.L = Oregon Short Line (North Yards)

O.S.L bought by U.P.?

For the other one-fourth of the distance 115' should be allowed. The value placed on this land is excessive as the land was practically worthless for cultivation.

#3. The claimant must mean to the NW Cor. SW 1/4 Sec. 14. It appears from the map in the NW 1/4 of Sec. 23 that the drainage channel passes over the east end of tract #11 for a distance of about 500' and this is the only place where the drainage channel encroaches on claimant's land.

The width of right of way in the complaint is excessive as measurement shows a total width covering spoil banks of 108 ft. 10' of west spoil bank is in O.S .L. & Utah Oil Refining Co. ditch, making a width of 98' to be considered as right of way. The value placed on this land is excessive as the land was practically worthless for cultivation.

#4. The width of right of way is excessive as measurements show a total width covering spoil banks to be 120'. The land through this section is very poor and the drainage channel has enhanced the value rather than damaged it.

#5. This statement is far fetched and the conditions are the same as stated in #1A of this report. The City built a bridge across the drainage channel near the center line of Sec. 23 at the time the channel was constructed. This makes it possible to get to land on either side of channel.

#6. The width of right of way is excessive. Measurements show a total width covering spoil banks to be 108' from the south side of section 10 north to where the trunk sewer empties into the drainage channel and from this point to the Jordan River it is a width of 156'. This is the amount that should be allowed for right of way. This land grows nothing but salt grass and in some places is too barren for that.

#7. The irrigation canal was not interferred with in the construction of the drainage channel except at the river crossing.

#8. Have no knowledge of this.

#9. I see the necessity of at least one bridge across the drainage channel. I find no evidence of the 12" tile drain.

#10. The drain ditch to the south of the drainage channel was enlarged and deepened improving the drainage conditions to the south. The drain ditch to the north was not filled, but left open so as to run either into drainage channel or to the north. There has been no damage done, but a benefit to his drain ditch as the drainage channel is much lower and gives a better chance for the land all around this area to be drained.

#11. The sewage is a drawback to this district, but the drainage channel carries the oil, and refuse from the Utah Oil and O. S. L. NOrth Yards to the lake where formerly the oil was turned into a slough near the center of Sec. 10, and during high water this oil was spread over the land making a menace to this section of the country.

The drainage channel has lowered the water plane and made it possible for this section of the country to be brought under cultivation, where before it was practically worthless land.

The information regarding the oil being turned into a slough was taken from Snyder's report.

Respectfully,

L. Jessen

LT:CF

SALT LAKE CITY CORP.
PUBLIC UTILITIES

ENGINEERING

Voice 483-6781
FAX 483-6855
FAX 483-6818

Project ______
Subject ______
Project # ______ E.W.O. # ______
By ______ Date ______
Ck. by ______ Date ______

Problem
History
Given
Assumptions
Reasoning
Solution
Conclusions

1. Union Pacific Floor Drain
Oil Dump
Get with Mel Muir (Melvin K. Muir SL County Health Dept.)

2. Put Camera in our line
UP where? why.
Mel Muir

3. Call Joe @ Amoco
Bkw ups. Tests from line
What?

1. 1900 gallons of used engine oil last Thursday. Accidental. Outside ~~tank~~.
Manhole 4 water from shop are?

Where water line broke.

100 ft South of Park

hot springs 1450 North under amocos property. slip line up pipe.

To: The Honorable Mayor Ted Wilson
[redacted]
Councilman Ronald Whitehead, District #1

Subject: Summary of File 47-D-2 City Engineer

Date

Sept. 12, 1922 — Agreement between SLC and Utah Oil Refining Company on use and construction of canals. Liability clause in contract.

Jan 25, 1926 — To: P.J. Moran, Commisioner of Streets
From: Acting City Engineer (HCJ)

"For a number of years the Utah Oil Refining Company has been discharging into the Gravity Outlet Sewer about 300,000 gallons of water (oily and industrial waste) from its refinery per day."

Aug 2, 1926 — To: H.C. Jessen City Engineer [redacted]
From: L. Tanner (association unknown)

"The following is a report of the investigation of the complaint of the Jordan Investment Company....."
[redacted] Comments: no report attached.

"The drain ditch to the south of the drainage channel was enlarged and deepened....." "The drain ditch [redacted] to the north was not filled but left open....."

"The sewage is a drawback to this district, but the drainage channel carries the oil, and refuse from the Utah Oil and Oregon Short Line North Yards to the lake where formerly the oil was turned into a slough near the center of Section 10, and during high water this oil was spread over the land making a menace to this section of the country.
comments: Section 10 is just north of the Fairgrounds.

Sept. 9, 1927 — To: P.J. Moran, Commissioner of Streets
From: City Engineer (HCJ)

"the main canal at high [redacted] stages overflows its west bank...."

"Jordan Fur & Reclamation complained that part of their land is being damaged by the sewage & oil waste....."

Nove 8, 1949 — To: E.R. Christensen, City Attorney
From: City Engineer

"Several years ago (about 1939) your office borrowed our files on the Salt Lake County Drainage District #2. Mr. Romney was assigned to this job by your office. The records were not returned to this office. "

Nov. 15, 1946 — To: W.D. Beers City Engineer
From: Christensen, City Attorney

Date see 1st pg.

" I thought the file had been returned. It is a large file and could not be lost."

Nov. 14. 1949

To: Matheson, Commisioner
From: City Engineer (copy unsigned) (MNM)

reference to "oily acid wastes....."

Nov 21, 1949

To: Utah Ice and Storage
From: City Engineer

" An investigation is being made by the City of water being discharged into the City drains in the northwest part of the City....."

"The information we require is as follows: Source of water, whether City or from wells, waste products carried by water, temperature at point of discharge, quantity discharged, steady or intermittent flow, length of time such discharge has been made, and whether or not an agreement exists between your Company and the City.
We would appredeate your cooperation in furnishing the above requested information this week, so that it m ay be incorporated in a report now being prepared by this office."

Comment: no record of report and no record of the same information being requested of other industries.

Nov. 14, 1949

Preliminary Report on Drainage Pipe Lines for Northwest Part of City.

"The area north of 9th north and west of 8th west is being considered for extensive development, which means that troublesome wastes now being carried in open drains must either be excluded from the drains or carried in pipe lines to a point beyong expected development. The sulphur water and oily wastes must be carried in a pipe which will not be disintegrated by their chemical action."

Nov. 28, 1949

To: John Matheson, Commissioner of Streets
From: City Engineer

regarding flow estimates:

Utah Oil Refinery:	16,000 gallons/day
Union Pacific	6400 gallons/day

Jan 19, 1950

To; Roy McLeese

From: M. McKendrick, Assistand Engineer of Sewers

".....no meeting has been held with (Salt Lake) Refinery representatives since the letter was received from them , but waste water is now being discharged from the refinery into the City drain canal."

Feb 8, 1950

To: C.E. Finney, Jr. President Salt Lake Refinery Co.
From: City Engineer

" I am informed that you have availed yourself of this drainage canal."

Aug 24, 1950

To: Edward Holmes, Alan Brockbank, Union Pacific, Utah Oil Refinery

From: City Engineer (LWM)

"meeting"..."for the purpose of further discussing the drainage ditch problem."

To: Ray Christensen, City Attorney
From: City Attorney

".....,to discuss further the problem confronting the Commission regarding drainage of the Northwest area of the City."

"All information or reports regarding this project should be reviewed and ready for presentation to this group at the meeting."

Comment: no copy of [redacted] reports.

Oct. 2, 1950

To: Utah Ice & Storage

From: Commissioner of Streets (LWM)

"The present open drain in this area is at present a nuisance and emits very pungent odors."

Oct. 13, 1950

T Record of Meeting Oct. 10. 1950

Cost of filling the drainage canals of the Northwest Area to the Real Estate Promoters: $25,300.

Oct. 2, 1950

To: J.B. Davis, Chief Engineer
From: Commissioner of Streets (LWM)

"Because of the urgency of this matter the next meeting....."

May 3, 1951

To: Roy McLeese

From: Lynn Thatcher, Director, Division of Sanitary Engineering.

Bill Cleff using drainage ditches for irrigation.

April 12, 1951

To: Lynn Thatcher, Director, Division of Sanitary Engineering.

From: Roy McLeese, City Engineer

Waste water from Cudahy Packing Plant [illegible] is being diverted northwesterly through the abandoned gravity sewer canal and this diversion is not authorized by the city.

May 23, 1951

To: Roy McLeese, City Engineer

From: [illegible] LWM, City Engineer

".....which has been causing so much trouble with oil and fumes from discharge waste, particularly from the Utah Oil Refining Company and the Union [illegible] Pacific Railroad Company."

May 25, 1951

To: Joe Christensen, Commissioner of Streets

From: Roy McLeese, City Engineer

"Because of the urgency of doing something to alleviate this nuisance,....."

July 31, 1951

To: Union Pacific Railroad

From: Commissioner of Streets (LWM)

"This problem has reached a point where something must be done and the solution must be worked out soon to grant [illegible] relief to a very obnoxious and bad condition, therefore, a meeting is hereby called....."

Aug 14, 1951

To: UNion Pacific Railroad

From: Roy McLeese, City Engineer

".....to alleviate a very obnoxious and bad drainage condition now in existence."

"Because of the obnoxious odors, the fine spray of oil on adjacent houses on 9th North Street in the vicinity of this ditch numerous complaints are received by the City, and something must be done to correct this c ondition. We have discussed this matter and feel that those causing the nuisance should pay proportional costs and further that the work shall be done as soon as possible."

"The nature of the waste drainage from the Utah Oil Company will necessi. ate the painting of the pipe to

limit the attack on the concrete pipe...."

Sept. 24, 1951

To: Roy McLeese, City Engineer

From: Union Pacific Railroad

letter disagrees with proportioned costs to the industries involved.

"Second, we doubt that the City has requested other property owners or industries to contribute such a large proportion of the ocst in similar projects under circumstances where no corrosive liquèds are discharged into a sewer system by such property owners or industries, as is the case with the Union Pacific no.w.

"Third, it seems to us that those who will benefit most from the proposed project are the real estate promoters

"........the solution now suggested is obviously inadequate to solve the problem permanently."

March 11, 1952

To: Union Pacific Railroad

From: Roy McLeese, City Engineer

"....at the above meeting to discuss this serious problem [illegible] confronting Salt Lake City in the matter of eliminating an existing nuisance created by the type of waste now [illegible] flowing in this open ditch......."

"This created nuisance and accompanying odors are the source of many complaints from property owners in the area and we feel that something must be done."

January 3, 1952

To: Utah Oil Refining Company

From: Roy McLeese, City Engineer

"......you are aware of the petition for rezoning this area......."

August 1952
(undated)

Agreement between Salt Lake City and Utah Oil Refining Company.

Agreement stipulates further usage or and plans for [illegible] the new pipeline to carry industrial waste and sewage.

"WHEREAS, it now appears that numerous and diverse residents living west of the Oil Company's property and nearby the aforementioned drain are complaining that fumes and disturbing odors are carried into their homes to the annoyance and discomfort of all concerned, and said residents are threatening to

sue to have the Oil Company

enjoined from continuing to transpost the waste materials from its refinery through an open channel; and...."

Aug 8, 1952 To: Joe Christensen, Commissioner of Streets

From: Roy McLeese, City Engineer

"In view of the urgency and necessity of abating this nuisance is is my recommendation....."

Aug 14, 1952 To: A,D. Hansen, Union Pacific Railroad

From: Roy McLeese, City Engineer

".....regarding this bad situation which we all feel should be abated....."

Dec. 23, 1952 To: Roy McLeese, City Engineer

From: Gale D. Smith, Chairman
Rose Park Residents Committee

"As Chairman of the Residents Committee of Rose Park, I want to take this opportunity of expressing our sincere thanks and appreciation to you personally for eliminating this obnoxious situation from our area."

Comment: penciled in at bottom of copy of letter are the words "follow thru with BRM for filling ditch , etc."

List of Industries using the drainage system (incomplete)

Jordan Fur & Reclamation

Utah Refining Company
Utah Ice & Storage Company
Union Pacific Railroad
Cudahy Packing Plant
Salt Lake Refinery
Oregon Short Line Railroad
"Old Copper Plant"
others as yet to be discovered